C21.5: 956/3

Vol. 956 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 15, 1977

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

March 15, 1977 Volume 956 Number 3

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PATENT NOTICES

Certificates of Correction for the Week of Mar. 15, 1977

Re. 29,107	3,963,800	3,987,892	3,994,239
D. 241,980	3,964,663	3,988,039	3,994,504
D. 242,765	3,965,193	3,988,113	3,995,296
D. 242,773	3,965,357	3,988,238	3,995,474
3,793,384	3,966,440	3,988,427	3,995,505
3,812,000	3,967,989	3,988,488	3,995,564
3,848,119	3,969,338	3,989,278	3,995,691
3,856,771	3,970,997	3,989,452	3,995,716
3,964,572	3,972,029	3,989,515	3,995,793
3,879,455	3,972,465	3,989,618	3,996,102
3,897,154	3,974,253	3,989,739	3,997,232
3,923,865	3,976,832	3,989,899	3,997,524
3,931,585	3,977,596	3,990,288	3,997,746
3,932,388	3,978,572	3,990,773	3,997,816
3,937,565	3,978,950	3,990,952	3,997,923
3,945,994	3,979,286	3,990,963	3,997,946
3,947,027	3,979,757	3,990,978	3,998,005
3,951,636	3,979,897	3,991,452	3,999,733
3,952,531	3,980,818	3,991,524	4,000,661
3,953,054	3,983,210	3,991,926	4,000,761
3,953,869	3,983,340	3,992,205	4,000,802
3,954,888	3,983,885	3,992,454	4,000,862
3,955,180	3,984,210	3,992,615	4,000,949
3,956,393	3,984,868	3,992,648	4,001,041
3,956,428	3,985,923	3,992,700	4,001,411
3,956,467	3,986,011	3,993,017	4,001,902
3,956,496	3,986,151	3,993,229	4,002,185
3,958,055	3,986,390	3,993,482	4,002,345
3,958,162	3,987,024	3,993,521	4,002,386
3,959,439	3,987,094	3,993,730	4,002,736
3,961,096	3,987,268	3,993,876	4,003,008
3,961,234	3,987,455	3,994,021	4,003,537
3,963,538	3,987,859	3,994,059	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 29, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-17-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-15-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-2-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-20-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-15-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-1-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-6-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-23-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-1-76

Expiration of patents: The patents within the range of numbers indicated below expire during February 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 600, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,923,008 to 2,926,351, inclusive
Plant Patents..... Numbers 1,901 to 1,918, inclusive

REISSUES

MARCH 15, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

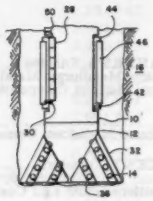
Re. 29,151
REPULSING CLAYS ON DRILL BITS

Stanley B. McCaleb, Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Original No. 3,818,996, dated June 25, 1974, Ser. No. 296,358, Oct. 10, 1972. Application for reissue Mar. 27, 1975, Ser. No. 554,883

Int. Cl.² E21B *7/00, 17/00*

U.S. Cl. 175—57 **8 Claims**



3. A process for drilling wellbores through a sticking shale earth formation comprising: applying a rotating drill bit to the formation; and impressing a negative charge to the drill bit while drilling through the shale formation by locating directly adjacent the drill bit a metal having a higher electromotive force than that of the drill bit.

4. Apparatus for drilling through earth formations having a high concentration of fine materials including clays comprising: a drill bit *having teeth*; drill pipe attached to the drill bit and extending to the surface; and means for impressing a negative charge on the drill bit, said impressing means being a metal which is located between the teeth on the drill bit [.], *said metal including magnesium.*

Re. 29,152
PROCESS FOR THE ENZYMATIC ISOMERIZATION OF DEXTROSE TO LEVULOSE

Frederick C. Armbruster, La Grange; Robert E. Heady, Park Forest, both of Ill.; Robert P. Cory, deceased, late of La Grange, Ill., by Cynthia S. Cory, a/k/a Cynthia S. Timmerman, executrix, Danville, Ind., assignors to CPC International Inc., Englewood Cliffs, N.J.

Original No. 3,813,318, dated May 28, 1974, Ser. No. 181,639, Sept. 17, 1971. Application for reissue Apr. 16, 1976, Ser. No. 677,728

Int. Cl.² C12D *13/02*

U.S. Cl. 195—31 F **12 Claims**

1. A process for the production of levulose comprising:

(a) subjecting a microorganism of the Streptomyces genus to a mutagenic agent;

(b) isolating the mutant strain of the microorganism that has the capacity to form an appreciable quantity of xylose isomerase when cultivated in a nutrient medium that is free of xylose and xylose-supplying materials;

(c) cultivating the isolated mutant strain in a nutrient medium to produce xylose isomerase; and

(d) isomerizing dextrose to levulose with [said] *a* xylose isomerase [.] *enzyme preparation derived from a mutant strain of a Streptomyces microorganism, said mutant strain being characterized in that when cultivated in a nutrient culture medium that is free of xylose and xylose-supplying materials, it produces at least 50% more xylose isomerase activity than Streptomyces olivochromogenes ATCC No. 21,114 under identical conditions of cultivation.*

10. A process for the production of levulose comprising: isomerizing dextrose to levulose with a xylose isomerase enzyme preparation derived from a mutant strain of a Streptomyces microorganism, said mutant strain being a member selected from the group consisting of Streptomyces olivochromogenes ATCC No. 21,713, Streptomyces olivochromogenes ATCC No. 21,714 and Streptomyces olivochromogenes ATCC No. 21,715, variants and sub-mutants thereof.

Re. 29,153
CERTAIN N-PHENACYL PYRIDINIUM HALIDES

Wendell Gary Phillips, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

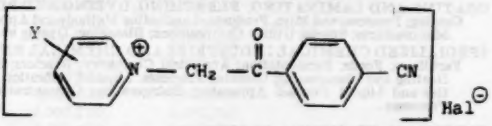
Original No. 3,776,916, dated Dec. 4, 1973, Ser. No. 260,672, June 7, 1972. Division of Ser. No. 878,918, Nov. 21, 1969, Pat. No. 3,702,361. Application for reissue Feb. 19, 1974, Ser. No. 443,554

Int. Cl.² C07D *213/84*

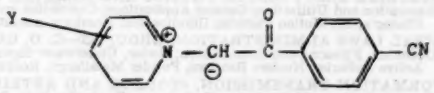
U.S. Cl. 260—294.9 **4 Claims**

13. An N-substituted heterocyclic compound selected from the group consisting of

(1) N-(4-cyanophenacyl)halides of the formula



and (2) ylids of the formula



wherein "Hal" is a halogen of the atomic weight in the range of 35 to 127, and Y is selected from the group consisting of nitro, cyano and halogen of atomic weight in the range of 35 to 127, and acyl of the formula

wherein R' is lower alkyl.

Re. 29,154
TRANSCEIVER CHANNEL SELECTOR

Louis E. Schonegg, Indianapolis, Ind., assignor to Regency Electronics, Inc., Indianapolis, Ind.

Original No. 3,854,093, dated Dec. 10, 1974, Ser. No. 353,140, Apr. 20, 1973. Application for reissue July 29, 1975, Ser. No. 600,084

Int. Cl.² H04B *1/40*

U.S. Cl. 325—18 **14 Claims**

1. Channel selector means for a transceiver having a transmitter including a modulator and a receiver including a frequency mixer comprising:

a. a first oscillator having an output connected to the mixer,

b. first frequency determining means for causing said oscillator to oscillate at one of a first plurality of selected frequencies,

c. said first frequency determining means including a first plurality of frequency resonant elements, *there being a one-to-one correspondence between said frequency resonant elements and said frequencies,*

d. a second oscillator having an output connected to the modulator,

e. second frequency determining means for causing said oscillator to oscillate at one of a second plurality of selected frequencies,

f. said second frequency determining means including a second plurality of frequency resonant elements, *there being a one-to-one correspondence between said last mentioned frequency resonant elements and said last mentioned frequencies*,

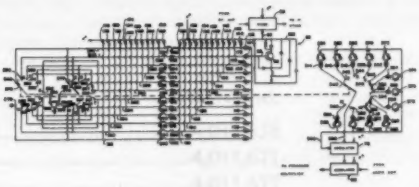
g. selectively operable first selection means for selecting a particular resonant element from said first plurality of frequency resonant elements and when operable [to associate] *for associating* said particular resonant element selected thereby with said first oscillator to determine said one of a first plurality of selected frequencies,

h. selectively operable second selection means for selecting a particular resonant element from said first plurality of frequency resonant elements and, when operable, [to associate] *for associating* said particular resonant element selected thereby with said first oscillator to determine said one of a first plurality of selected frequencies.

i. third selection means for selecting a particular resonant element from said second plurality of frequency resonant elements and associating said particular resonant element selected thereby with said second oscillator to determine said one of a second plurality of selected frequencies,

j. a switch means for rendering said first selection means operable and said second selection means inoperable when in a first state and said second selection means operable and said first selection means inoperable when in a second state,

k. means connected to said second selection means for actuating said second selection means to select a particular resonant element from said first plurality of resonant elements, and



l. means connected to said first and third selection means for actuating said first and third selection means in unison to select a particular resonant element from said first and second plurality of frequency resonant elements, respectively.

PATENTS

GRANTED MARCH 15, 1977

ERRATA

For CLASS	See PATENT NO.
403–171	4,011,638
035–007	4,011,671
047–055	4,011,677
403–231	4,011,706
081–186	4,011,778
089–047	4,011,794
404–015	4,012,156
429–048	4,012,234
427–212	4,012,507
358–084	4,012,583
358–302	4,012,584
358–285	4,012,585
358–285	4,012,586
358–213	4,012,587
358–150	4,012,592
178–069.1	4,012,598
325–028	4,012,662
361–213	4,012,666
361–016	4,012,667
361–044	4,012,668
361–097	4,012,669
361–117	4,012,670
361–249	4,012,671
361–422	4,012,672
361–196	4,012,673

PATENTS

GRANTED MARCH 15, 1977

ERRATA

Pat. CLASS	Pat. PATENT NO.
403-171	4,011,558
033-007	
047-055	4,011,671
403-231	4,011,677
081-186	4,011,706
059-047	4,011,758
406-015	4,011,764
429-048	4,012,156
427-213	4,012,274
358-084	4,012,307
358-302	4,012,583
358-285	4,012,584
358-285	4,012,584
358-213	4,012,586
358-120	4,012,587
178-069.1	4,012,592
425-028	4,012,602
361-213	4,012,666
361-016	4,012,667
361-064	4,012,668
361-067	4,012,669
361-117	4,012,670
361-249	4,012,671
361-422	4,012,672
361-196	4,012,673

PATENTS

GRANTED MARCH 15, 1977

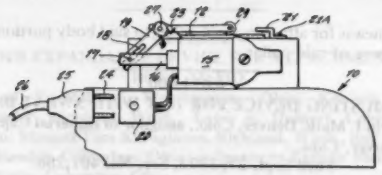
NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,011,594
WELDING MASK WINDOW DOOR AUTOMATIC OPERATION

Antoine L. Guilbaud, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007

Filed Sept. 29, 1975, Ser. No. 617,326
Int. Cl.² A61F 9/06
U.S. Cl. 2—8 **3 Claims**

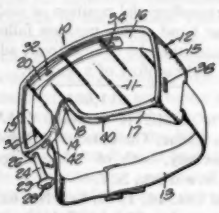


1. A welding mask having a door pivotally mounted on a door frame surrounding an opening said door being pivotally movable between an opened and a closed position, said door having a transparent, tinted window whereby a user can look through said door at strong light when said door is in closed position, in combination with electrically operated means mounted on said frame for pivoting said door from the open to the closed position, said means comprising solenoid relay means supported on said frame, a lever, said solenoid relay having a plunger pivotally engaging one end of said lever mounted rotatably on said frame side including an opposite end of said lever carrying a roller that bears against the front of said door to urge said door pivotally closed, when said relays are electrically actuated, including a spring biasing said door the open position.

4,011,595
DEFOGGABLE GOGGLES

Michael Peter Shields, 6647 Glade St., Canoga Park, Calif. 91303

Filed Aug. 28, 1973, Ser. No. 392,253
Int. Cl.² A61F 9/02
U.S. Cl. 2—436 **8 Claims**



1. Improved goggles of the type having a lens mounted in a one piece frame structure which includes rearwardly extending side, top and bottom peripheral wall members the rear edges of which are shaped to conform closely to the face of the wearer extending about the eyes and over the nose thereby defining an enclosed inner airspace between the lens and the face of the wearer, the improvement comprising:

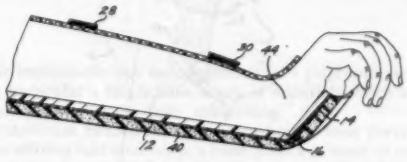
two or more air inlet apertures formed in a first one or more of said wall members, manifold means affixed to one of said wall members other than said first wall members, said manifold means having an internal passage, means connecting said passage with said enclosed airspace, a housing having a chamber, said housing being coupled to and forming a part of said manifold, said chamber communicating with said passage; and

conduit means coupled to said manifold means, said conduit means extending externally of said frame structure a distance sufficient to reach the mouth of the wearer thereof when said frame structure is positioned about the eyes and over the nose of the wearer, said chamber adapted to slideably receive said conduit means therein.

4,011,596
FOREARM AND WRIST PROTECTOR

Enrique G. Chang, 16992 Courtney Lane, Huntington Beach, Calif. 92649

Filed Dec. 3, 1975, Ser. No. 637,133
Int. Cl.² A41D 13/08
U.S. Cl. 2—16 **8 Claims**



1. A protective device comprising:

a rigid, load-bearing splint to extend along the underside of the forearm of the wearer thereof from the upper portion of the forearm to the metacarpal-phthlangic joint, overlying the palm of the hand, to provide protective, load-bearing support for the distal, ulna, radius and carpus of said wearer;

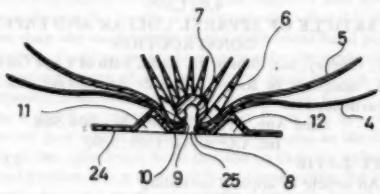
cushion means carried on the outside surface of said splint means for absorption of impacts thereto; and

limb encircling means including fastening means for repeated attachment and detachment for removably securing said splint to a wearer's forearm and hand.

4,011,597
BATHER'S CAP AND METHOD OF MAKING THE SAME

Friedrich Kraus, Lieschingstrasse 1, 7000 Stuttgart, Germany

Filed Aug. 30, 1974, Ser. No. 502,009
Claims priority, application Germany, Aug. 31, 1973, 2343881; June 27, 1974, 2430837
Int. Cl.² A42B 1/12
U.S. Cl. 2—68 **14 Claims**



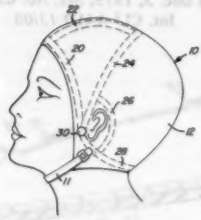
1. A bather's cap comprising, in combination, a cap body provided on its outer side with at least one elastic hollow mounting plug integral with said cap body and having an enlarged end constituting a head integrally joined to the adjoining portion of said cap body by a neck of a cross-section

smaller than that of said enlarged end, and at least one ornamental component having an opening of a predetermined cross-section smaller than the maximum cross-section of said enlarged end with said neck of said plug extending through said opening whereby said ornamental component is mounted on said cap between said enlarged end of said mounting plug and said adjoining portion of said cap body.

4,011,598
BATHING CAP

Kittie Anne Sherr, 197 Inwood Ave., Upper Montclair, N.J. 07043, and Mirian Garabrant, 217 Montclair Ave., Montclair, N.J. 07042

Filed Aug. 15, 1975, Ser. No. 605,075
Int. Cl.² A42B 1/12
U.S. Cl. 2—68 **8 Claims**



1. A bathing cap adapted for emplacement over the head of a wearer to secure the head during periods of bathing from penetration by a surrounding liquid medium, having in combination an outer water impervious covering and an inner framework, said framework comprising:

a first resilient strip of material having a parabolic configuration and being adapted to extend around the forehead of the wearer from a first location on one side of the face near the ear to a second substantially symmetrical location on the opposite side of the face;

a second strip of material adapted to surround the nape of the wearer's neck;

means for pivotally connecting said first strip to said second strip at said first and second locations respectively; and

means for maintaining a predetermined separation between said first and second strips, including brace means connected to said second strip of material on each side of the head about each ear and operatively connected to said first strip.

4,011,599
ARTICLE OF APPAREL COLLAR AND LAPEL CONSTRUCTION

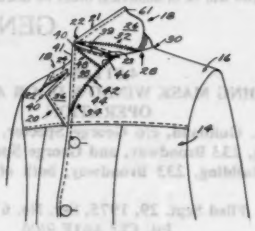
Roy L. Chaney, and Sandor G. Rada, both of Cape Girardeau, Mo., assignors to Ralph Edwards Sportswear, Inc., Cape Girardeau, Mo.

Filed Aug. 21, 1975, Ser. No. 606,586
Int. Cl.² A41B 1/00, 3/00
U.S. Cl. 2—116 **23 Claims**

1. An article of apparel including

a. a body portion,

b. a collar formed separately from said body portion, said collar comprising two layers of material, a bottom layer and a top layer, said bottom layer comprising an underside, and said collar further comprising a pair of tips each formed by converging edges of said underside, and a base, and a seam extending from each tip toward said base on the underside of said collar between said tip forming edges and joining said edges, and



c. means for attaching said collar to said body portion at the base of said collar.

4,011,600
ADJUSTING DEVICE FOR HAT WITH SWEAT BAND

Marvin I. Malk, Denver, Colo., assignor to Imperial Caps, Inc., Denver, Colo.

Filed Sept. 27, 1973, Ser. No. 401,286
Int. Cl.² A42B 1/22
U.S. Cl. 2—183 **1 Claim**

1. In a hat having a crown and a continuous inturned sweat band of flexible material secured along its lower edge to the lower internal periphery of the crown and lying along the inner surface of the crown; the improvement comprising draw band means permanently secured at one end to said sweat band at the inner side of said sweat band adjacent said crown and extending circumferentially along a portion of the interior circumference of the sweat band, a passage defining strip overlying said draw band means and secured to said sweat band above and below said draw band means to define a pasage loosely enclosing said draw band means, said passage defining strip being of a circumferential extent less than that of the draw band, and cooperating flexible universally adjustable fastening means on said sweat band and said draw band for detachably securing the opposite end of said draw band to said sweat band, said fastening means being operable for adjusting the circumferential position of said draw band relative to said sweat band at any position falling within a given range of adjustment thereby to selectively adjust the fit of said hat to the head and comfort of a wearer.

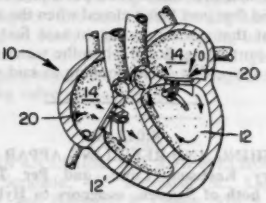
4,011,601
PROSTHETIC HEART VALVE

Michael Francis Clune, Oneonta, and John Richard Shanebrook, Schenectady, both of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,061
Int. Cl.² A61F 1/22
U.S. Cl. 3—1.5 **7 Claims**

1. A prosthetic heart valve comprising a base member and an occluder disc having upstream and downstream curvilinear faces, the downstream face being concave, and the upstream face being convex, said concave and convex faces defining a high camber airfoil-like structure having leading and trailing edge portions, means supporting the occluder disc for (a) movement longitudinally downstream relative to the base member to move the upstream face out of seating engagement with said base member, and (b) rotational movement about an axis between the leading and trailing edges of the disc and means on said base member providing a seat for the marginal

portion of the upstream curvilinear face of the disc said seat providing means having a curved profile that matches the



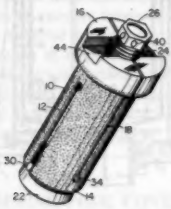
curved profile of the upstream curvilinear face of the occluder disc.

4,011,602

POROUS EXPANDABLE DEVICE FOR ATTACHMENT TO BONE TISSUE

Edmund F. Rybicki, Worthington, Ohio; Kenneth Ray Wheeler, Richland, Wash.; Lewis E. Hulbert, Columbus, Ohio; Manuel Tom Karagianes, Richland, Wash., and Craig R. Hassler, Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Oct. 6, 1975, Ser. No. 620,042
Int. Cl.² A61F *1/24*; A61C *13/00*
U.S. Cl. 3—1.9 **2 Claims**



1. A device for attaching to substantially solid living tissue, comprising

a body member having an outer surface shaped to fit approximately into an empty space in the tissue and having pores into which the tissue can grow to strenthen the bond between the device and the tissue,

the body member comprising a cylindrical portion having at least one radial slit extending longitudinally from a first end to the vicinity of the opposite end thereof, at least one radial slit extending longitudinally from the second end to the vicinity of the first end thereof, and a tapered cylindrical hole extending coaxially from a wider circular opening in the first end to a narrower circular opening communicating with the second end,

adjustable means for expanding the body member against the tissue to an extent such as to provide a compressive stress capable of maintaining a snug and stable fit and of enhancing the growth of the tissue into the pores in the body member,

the adjustable means comprising a cylindrical member having a tapered portion fitting snugly into the tapered hole in the body member at the first end and a narrower portion extending through the second end, and means for controlling its position in the body member,

the portion of the cylindrical member extending through the second end of the body member being threaded and the position controlling means comprising a threaded member positioned thereon so as to exert force against the second end, and

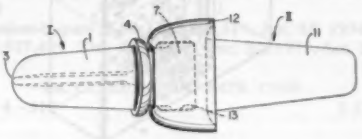
means for holding the threaded member in a fixed position on the cylindrical member and means for preventing relative rotation between the cylindrical member and the body member.

4,011,603

FINGER JOINT IMPLANT

Arthur D. Steffee, Gates Mills, Ohio, assignor to Laure Prosthetics, Inc., Portage, Mich.

Filed Aug. 29, 1975, Ser. No. 608,849
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **7 Claims**



1. An implantable type endoprosthesis for a ginglymus joint, and in particular a finger joint, made of materials which are substantially inert to the body, comprising:

a protuberant headed member comprising a stem portion for affixing said member in a bone, a neck portion on one end of said stem portion, and a protuberant head portion on said neck portion, said protuberant head portion being of cylindrical shape and having an axial length which is greater than its diameter;

a socketed member comprising a stem portion for affixing said member in a bone, and a polymeric socket portion at one end of said stem portion having wall portions defining an at least partially semicylindrical socket cavity of radial and axial dimensions for snugly embracing said cylindrical head portion, said socket cavity being accessible through a generally rectangular aperture which is elongated in a direction parallel to the axial directions of said cylindrical head portion and said socket cavity;

said socket portion having resilient lip means extending completely around the periphery of the aperture for reducing the size thereof so that it is smaller than the axial cross-section of said cylindrical head portion, whereby said resilient lip means resiliently retains said head portion within said socket cavity, said resilient lip means including a first pair of resilient lips extending along the opposite side edges of said aperture with the transverse spacing between the lips of said first pair being slightly less than the diameter of said cylindrical head portion, said lip means also including a second pair of resilient lips extending along the opposite end edges of said aperture for reducing the length of the aperture so that it is slightly less than the axial length of the cylindrical head portion, the lips of said second pair engaging the circumferentially extending edges of said cylindrical head portion at the opposite axial ends thereof, whereby said socket cavity has a depth as measured inwardly from the lips of said second pair which is substantially the same as the diameter of the cylindrical head portion so that the cylindrical head portion when removably retained within the socket cavity does not protrude radially outwardly beyond said lip means;

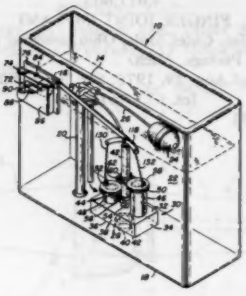
whereby the relationship of said cylindrical head portion with said socket portion permits relative pivotal movement between said headed and socketed members only within a single plane so that said endoprosthesis approximates the motion of a natural ginglymus joint.

4,011,604

APPARATUS EMPLOYING A THREE PORT CHAMBER AND TWO SELECTIVELY OPERABLE VALVES FOR CONTROLLING THE QUANTITY OF WATER FLUSHED BY A TOILET

Forrest C. Goldsworthy, 2595 Aragon Court, San Jose, Calif. 95125

Filed Apr. 26, 1976, Ser. No. 680,047
Int. Cl.² E03D *1/34, 5/02;* **A61B** *19/00*
U.S. Cl. 4—34 **11 Claims**



1. In a toilet including a tank having a water outlet, an improved apparatus for controlling the quantity of water flowing through the outlet comprising:

a rotatable shaft having opposed first and second ends;

a crank connected to said first end and being capable of rotating said shaft through first and second angles when a force is applied to it;

means mounting said crank to the tank;

an arm connected to said second end;

means forming a chamber disposed in the tank and including first and second upwardly extending tubes forming first and second ports, respectively, and a third port arranged to discharge water through the water outlet, said first tube having an axial dimension that is greater than said second tube;

first valve means normally seated on said first port, said first valve means being movable from a normally closed position to an open position;

second valve means normally seated on said second port, said second valve means being movable from a normally closed position to an open position;

a pivot rod having first and second outer portions and an intermediate portion that is pivotally connected to said arm;

a first chain connected between said first outer portion and said first valve means and having a first length generally equal to the distance between such elements when said first valve means is in the closed position; and

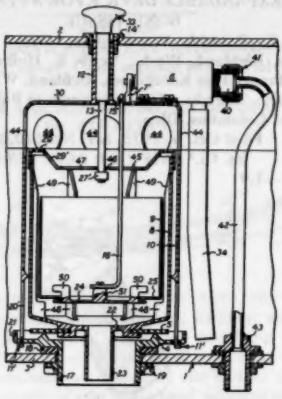
a second chain connected between said second outer portion and said second valve means and having a second length generally equal to the distance between such elements when said first valve means is in the open position, whereby when said crank is rotated toward said first angle, said arm is raised causing said rod to pivot toward said first valve means, and said first chain to become taut and unseat said first valve means such that when said crank reaches said first angle said first valve means is moved into said open position causing water to flow through said first port and out of said third port, said first valve means being closed by the suction action of the outflowing water when it reaches a level slightly above that corresponding to said first port, and whereby when said crank is rotated through an angle greater than said first angle, said second chain becomes taut, said rod pivots toward said second valve means and thereafter unseats said second valve means such that when said crank reaches said second angle said second valve means is moved into said open position causing water to flow through said first and second ports and out of said third port, said first port being closed when the water level falls to about that corresponding to said first port and said second port being closed when the water reaches a level slightly above that corresponding to said second port.

4,011,605

FLUSHING AND REFILLING APPARATUSES

Frans Harry Karlsson, Lund, and Per Torsten Faxen, Bromma, both of Sweden, assignors to Hykon-Patent Aktiebolag, Lund, Sweden

Filed Dec. 12, 1974, Ser. No. 532,115
Claims priority, application Sweden, Dec. 12, 1973, 7316760
Int. Cl.² E03D *1/36*
U.S. Cl. 4—41 **7 Claims**



1. A flushing cistern having a flushing and refilling apparatus therein, a bottom discharge opening and a flushing valve seat connected to the bottom discharge opening, said apparatus comprising a refilling valve for regulating the flow of liquid into the cistern, a flushing valve for cooperating with said valve seat, an overflow member providing an overflow passage connecting said discharge opening to an upper level of the cistern, said overflow member being in the form of a cylindrical overflow tube which supports said flushing valve at its lower end and has a restricted tubular portion extending through and sealed in relation to said flushing valve, said tube being mounted coaxially in and guided by said cylindrical housing for vertical movement therein, a manually operatable actuating mechanism for unseating said flushing valve and opening said refilling valve to start a flushing and refilling cycle, a refilling valve closing means mounted in said overflow passage to be weighted by liquid flowing into the overflow member and connected to said refilling valve and to said actuating mechanism to be moved by said actuating mechanism to an upper position upon starting of said cycle and to close said refilling valve when weighted by liquid flowing into the overflow member, said refilling valve closing means including a cylindrical open vessel mounted coaxially in said overflow tube for receiving and collecting liquid when liquid is flowing thereinto, said vessel having a bottom opening and a movable bottom wall member for closing said opening, said bottom wall member being movable relative to said vessel to form a bottom drain valve and being mounted to be opened when lifting force is imparted to said vessel to insure that the vessel may be emptied under movement to its upper position, a support in the form of a cylindrical housing having a vertical axis and at least one opening forming a communication between said cistern and the interior of said housing, said sup-

port and said refilling valve, flushing valve, overflow member and refilling valve closing means being assembled to form a unit of assembled parts having said support as a common support, said support and said cistern having mating coupling means forming an easily releasable coupling accessible from within the cistern for mounting and dismounting said unit, and said refilling valve being mounted on said support for supporting said refilling valve closing means.

4,011,606

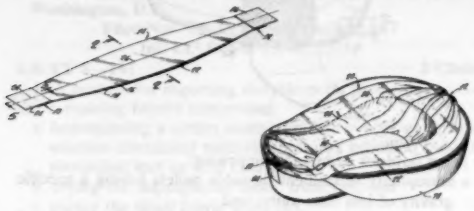
BEDPAN LINER, KIT AND METHOD

Catherine A. Scrafield, 465 Dartmoor St., Laguna Beach, Calif. 92651, and Margaret F. Leggat, 370 N. San Rafael, Pasadena, Calif. 91105

Filed Aug. 21, 1975, Ser. No. 606,440

Int. Cl.² A61G *9/00*

U.S. Cl. 4—112 **10 Claims**



1. A disposable bedpan liner for use with a conventional bedpan having a basin to receive wastes, comprising:

a sheet of flexible material for lining a bedpan basin, said sheet being gathered at opposite ends to form an elongated hammock-like expandable and contractible pouch;

means securing said ends in the gathered condition; and,

adhesive means for temporarily securing said sheet in an expanded condition to a bedpan.

4,011,607

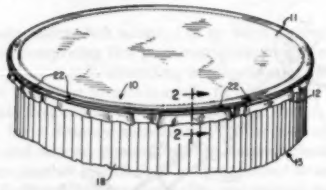
SWIMMING POOL COVER

Benjamin Davidoff, c/o Alcazar Pool Manufacturing Co., Inc., Irvington-on-Hudson, N.Y. 10533

Continuation of Ser. No. 477,441, June 7, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,760

Int. Cl.² E04H *3/19*

U.S. Cl. 4—172.12 **3 Claims**



1. A combination of a snap-on cover assembly and a swimming pool having a perimeter defined by a circumscribing coping, said coping includes a horizontal web portion and a depending vertical wall portion said wall portion terminating in a male locking lip of predetermined cross section,

a. said cover assembly comprising a sheet of flexible material of a size sufficient to completely cover said pool and said coping;

b. an elongated female resilient locking channel having an internal cross section generally congruent with said predetermined cross section of said male locking lip;

c. said locking channel including a flange portion and a tail portion interconnected by an arcuate portion and further including a knee portion interconnecting said arcuate and tail portions;

d. said male locking lip including a curl portion;

e. peripheral portions of said cover sheet being adapted to be juxtaposed to said locking lip and tightly clamped thereto by the snap-on placement of said locking channel thereover whereby said arcuate portion engages said male locking lip around said curl portion with said knee portion engaged adjacent and near the end of said curl portion and the flange portion matingly engaging a portion of said web wherein said cover will be securely locked in place by the mating of said channel with said lip with the peripheral cover portions interposed; and

f. whereby increased inwardly directed tensioning of said cover caused by the loading of the same will increase the degree of clamping of said cover to said coping.

4,011,608

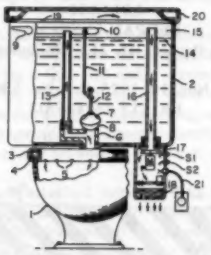
ELECTRIC TOILET DEODORIZER

Raymond H. Pearson, 627 Sherwood Drive, Richardson, Tex. 75080

Continuation-in-part of Ser. No. 434,519, Jan. 18, 1974, Pat. No. 3,927,429. This application Dec. 22, 1975, Ser. No. 643,596

Int. Cl.² E03D *9/04*; A47K *13/00*

U.S. Cl. 4—213 **6 Claims**



1. A water closet deodorizing accessary, said water closet including a toilet bowl and water tank, said water tank including a flushing means and overflow duct, said accessary comprising air duct means communicative with said overflow duct, an air blower means having an intake side and a discharge side, said intake side communicative with to said air duct means, and control means operable to initiate air flow through said air duct means, whereby odorous air may be drawn from said toilet bowl, through said overflow duct, said control means also operable to terminate said air flow, said control means including sensing means responsive to the change in operating characteristics of said air blower means when said overflow duct is flooded with water so as to impede said air flow when said toilet bowl is flushed, said sensing means having at least one parameter responsive to said change in operating characteristics, whereby said air flow may be terminated in response to said change in operating characteristics when said toilet bowl is flushed.

4,011,609

HOSPITAL TROLLEYS

Farkas Bethlen, Richmond, England, assignor to G. D. Searle & Co., High Wycombe, England

Filed Oct. 6, 1975, Ser. No. 619,831

Claims priority, application United Kingdom, Oct. 8, 1974, 43567/74

Int. Cl.² A47B *83/04*; A61G *1/02*

U.S. Cl. 5—81 B **9 Claims**

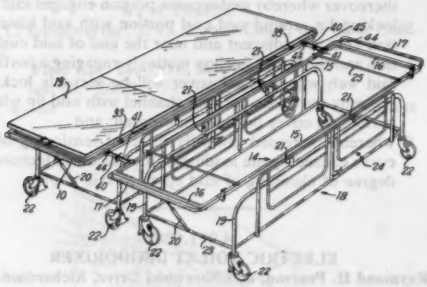
1. A hospital trolley comprising:

a patient support member;

a framework member adapted to carry said support member,

a guide rod attached to one of said members;

a hollow locating tube attached to the other of said members and adapted to cooperatively engage with said guide rod; and



a liner of low friction material adapted to be interposed between the outer surface of said guide rod and the inner surface of said locating tube when said guide rod is inserted into said locating tube.

4,011,610

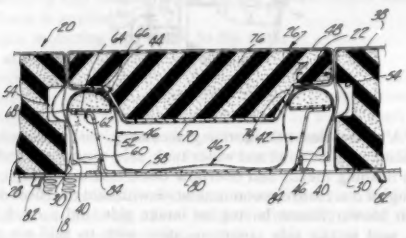
BEDPAN SYSTEM

John Castlereagh Parker, III, 2127 Philomene, Lincoln Park, Mich. 48146

Filed Nov. 10, 1975, Ser. No. 630,163

Int. Cl.² A61G 7/02

U.S. Cl. 5—90 **14 Claims**



1. In a bedpan system for use with hospital beds or the like, a foam mattress having a wall portion defining an aperture therein open at the upper surface of the mattress and projecting thereinto, a bedpan assembly comprising a pan portion and a seat portion and insertable into the aperture in said mattress with the seat portion disposed below the level of the upper surface of said mattress, a disposable flexible bag having a closed lower portion insertable through said seat portion into said pan portion and a mouth portion flexible over said seat portion, means for aiding in the support of said bedpan assembly in said aperture, said seat portion having a wall portion defining a central opening which opens into said pan portion, and a selectively removable mattress plug substantially conforming in peripheral shape to the shape of the aperture in said mattress and substantially conforming in height to the distance between said bedpan assembly and the upper surface of the mattress, and insertable in said aperture in a position to rest on said seat portion and present an upper surface substantially coplanar with the upper surface of said mattress, said mattress plug comprising a rigid base member having a depending central portion, an outer peripheral flange and a depending wall portion between said central portion and said flange, said plug peripheral flange overlying the upper surface of said seat portion and transferring the weight of said plug and of any weight on said plug to said upper surface of said seat, said plug wall portion depending within the opening in said seat portion and being closely adjacent to said wall portion of said seat portion to control the lateral position of said plug relative to the surface of said mattress.

4,011,611

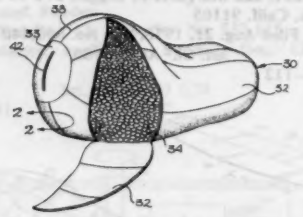
OUTDOOR BEAN BAG

Steven N. Lederman, Beverly Hills, Calif., assignor to Lederman's Incorporated, Los Angeles, Calif.

Filed Sept. 26, 1975, Ser. No. 617,034

Int. Cl.² A47C 27/00

U.S. Cl. 5—361 B **6 Claims**



1. An outdoor bean bag comprising:

a multiplicity of resilient flowable pellets having a specific gravity of less than unity; and

a flexible, water resistant cover forming a generally closed container filled by said multiplicity of pellets to less than 50 percent of the total interior volume of said container, said cover enclosing said multiplicity of resilient flowable pellets;

wherein said pellets distribute themselves in said water resistant cover so as to conform with and comfortably support the contours of the user's body.

4,011,612

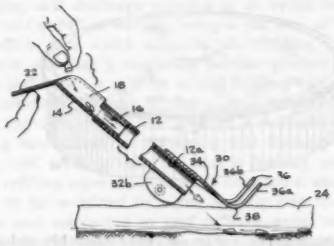
COMBINATION LAWN AND GARDEN IMPLEMENT

Wallace E. Atkinson, Petersburg, Va., assignor to Long Manufacturing Co., Inc., Petersburg, Va.

Filed Dec. 29, 1975, Ser. No. 645,032

Int. Cl.² B25F 1/00; H01B 49/04

U.S. Cl. 7—14.55 **10 Claims**



1. A lawn and garden implement comprising an enlongated hollow tubular handle having first and second opposite open ends, a furrowing tool fixed onto said first open end shaped to define a concavely curved trough portion extending outwardly from said first end and terminating in a generally planiform toe flange inclined to the longitudinal axis of the handle and shaped to a predetermined furrow contour to form a furrow in the soil when the implement is drawn over the soil with said first end down and the handle disposed in a first inclined position locating the toe flange in downwardly extending generally vertical relation from the handle axis, the concavely curved trough having an open throat portion communicating with the bore of the hollow handle at said first end whereby

the trough portion may be disposed in upwardly facing inclined relation to receive seeds and guide them into the hollow tubular handle for gravitational movement therethrough and discharge into a furrow in the soil from said second end when the implement is in predetermined second inclined position with said second end down, and the length of said handle being such as to enable the user to manipulate the furrowing toe flange in the soil from a standing position.

4,011,613
DURABLE-PRESS PROPERTIES IN COTTON CONTAINING FABRICS VIA POLYMERIC N-METHYLOL REAGENTS

Noelie R. Bertoniere; Stanley P. Rowland, and Earl J. Roberts, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

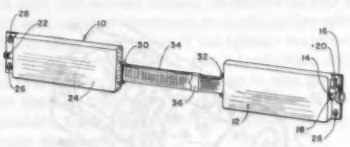
Filed Nov. 18, 1975, Ser. No. 633,067
Int. Cl.² D06M *13/48, 15/54*
U.S. Cl. 8—191 **2 Claims**

1. A process for imparting durable-press properties to cotton containing fabrics comprising:
   a. impregnating a cotton containing fabric with an aqueous solution containing methylolated urea modified polyethylenimine, and an acid catalyst;
   b. drying the impregnated fabric from (a); and
   c. curing the dried fabric from (b).

4,011,614
ADJUSTABLE FLOATATION BELT

Robert Bell, Campbell, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 21, 1975, Ser. No. 624,378
Int. Cl.² B63C *9/18*
U.S. Cl. 9—337 **10 Claims**

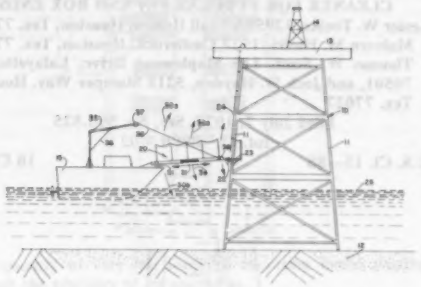


1. A water safety belt adapted to be worn around the waist of a person comprising first pneumatogenic means and second pneumatogenic means extending in a horizontal direction for a distance sufficient to substantially fit around the waist of a person, said first and second pneumatogenic means extending vertically for a distance substantially in the abdominal area, said first and second pneumatogenic means releasably joinable to one another by first tube means secured to and leading into said first pneumatogenic means and second tube means secured to and leading into said first pneumatogenic means, releasable coupling means for releasably joining said first and second tube means in a manner to form a conduit for the flow of a gas between said first and second pneumatogenic means, said releasable coupling means comprising collar means extending from the end of said first tube means and collar receiving means extending from the end of said second tube means, said collar means and said collar receiving means being adapted to couple to one another in order to hold said water safety belt around the waist of a person and to form a pneumatogenic seal, inflation means operably connected to said first pneumatogenic means through valve means for releasing gas into said tube means and said first and second pneumatogenic means, means for connecting the ends of said first and second pneumatogenic means opposite said first and second tube means.

4,011,615
PERSONNEL TRANSFER GANGWAY

Orwin G. Maxson, and Marvin L. Peterson, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Nov. 12, 1975, Ser. No. 631,016
Int. Cl.² E01D *1/00*
U.S. Cl. 14—71.1 **4 Claims**

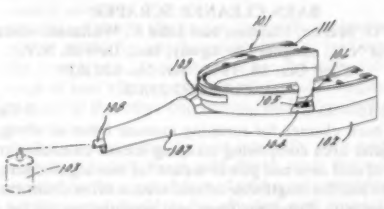


1. A personnel transfer gangway between a ship and a fixed structure, said gangway having first and second ends comprising:
   a. first and second mating extensible member means comprising a first and second set of parallelly-spaced bars, each set having a first end and a second end; means for rigidly securing said first end of each of said sets in a plane; means for slidably interlocking said second ends together; and spring biasing means mounted between said second ends of one set and the first ends of said remaining set;
   b. biasing means attached between said first and second extensible member means for forcing said extensible members to a predetermined length wherein force along the longitudinal axis of said mating extensible members will yieldably oppose elongating or shortening of said first and second mating extensible members about said predetermined length;
   c. means mounted to said first mating member at said first end of said gangway for securing said first mating member to said ship; and
   d. means mounted on said second mating member and said second end of said gangway for securing said second mating member to said fixed structure.

4,011,616
TEETH CLEANING DEVICE

Carroll W. Kennedy, 696 Neff Road, Grosse Pointe, Mich. 48230

Filed May 14, 1975, Ser. No. 577,291
Int. Cl.² A46B *13/02*
U.S. Cl. 15—21 R **9 Claims**



1. A toothbrush having a horseshoe configuration and channel-shaped cross section, the brush being fabricated of soft material with embedded bristles on one side, a base detach-

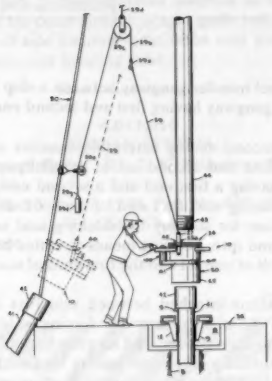
ably supporting said brush, a vibrator connected to said brush through said base, and a wall-mounted bracket supporting said vibrator and said brush, said base and brush being invertible whereby upper and lower teeth may be sequentially cleansed.

4,011,617

CLEANER FOR TUBULAR PIN AND BOX ENDS

Lester W. Toelke, 12958A Trail Hollow, Houston, Tex. 77024; Malvern M. Hasha, 1527 Castlerock, Houston, Tex. 77090; Thomas W. Scott, 116 Maplewood Drive, Lafayette, La. 70501, and Jack W. Hayden, 5215 Stamper Way, Houston, Tex. 77027

Filed July 7, 1975, Ser. No. 593,525
Int. Cl.² B08B *9/02*
U.S. Cl. 15—88 **18 Claims**



1. A cleaner for the threads on the pin and box ends of tubular members including:

a. housing means;

b. said housing means having open ends for receiving the pin end of a tubular member in one open housing end and the box end of a tubular member in the other open housing end;

c. brush means rotatably mounted in said housing means and positioned relative to said open housing ends for engaging the pin and box end threads on the tubular members; and

d. means for rotating said brush means to clean the engaged pin and box end threads of the tubular members.

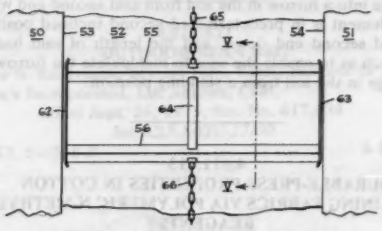
4,011,618

BARN CLEANER SCRAPER

Rodney O. Martin, Manlius, and John C. Whitman, Moravia, both of N.Y., assignors to Agway, Inc., DeWitt, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,639
Int. Cl.² B65G *25/08*
U.S. Cl. 15—93 R **5 Claims**

1. A barn cleaner for scraping manure from an elongated rectangular area comprising scraping means extending transversely of said area and power means for moving said scraping means to and fro lengthwise of said area, a drive chain extending in opposite directions from said scraping means for connection with said power means, said scraping means comprising a scraping element extending across a major portion of said rectangular area and comprising a pair of flange elements connected along their upper edges and extending obliquely downwardly to present an open side toward the surface to be scraped and provide a pair of scraping surfaces each inclined



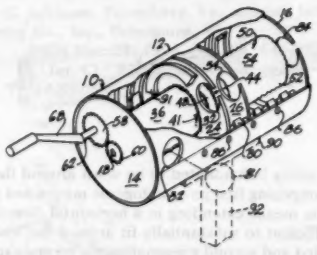
upwardly and rearwardly with respect to a respective one of the directions of movement of the scraping means.

4,011,619

GOLF BALL WASHER HAVING SCRUB, CLEAN AND DRY ELEMENT

Edwin L. Michalak, P.O. Box 253, Tucker, Ga. 30084

Filed Apr. 1, 1976, Ser. No. 672,786
Int. Cl.² A63B *47/04*
U.S. Cl. 15—97 R **10 Claims**



1. In a golf ball washing device:

an elongated housing for containing a cleaning solution,

end closures on said housing,

a first cleaning element mounted in said housing and comprising a surface similar to outdoor carpet material having small resilient fingers thereon,

a first baffle in said housing defining a first and second compartment therein,

at least one other second cleaning element in said second compartment having a pile surface comprising a highly absorbent material such as toweling,

means for rotating said first and second cleaning elements,

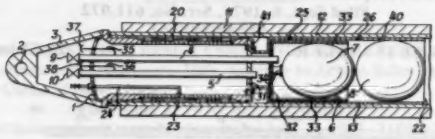
a spiral golf ball track on the inside of said housing and being wide enough to accommodate a golf ball and spaced from said cleaning elements so that a golf ball is forced into contact therewith during travel on said spiral track,

said first baffle having a golf ball hole therein and said track terminating at said hole to release said golf ball to said second compartment and second cleaning element.

4,011,620
PIPELINE TOOL FOR LAUNCHING TWO PIPELINE CLEARING SPHERES

Donald Alan Southgate, London, England, assignor to The British Petroleum Company Limited, London, England

Filed Apr. 1, 1975, Ser. No. 564,130
Claims priority, application United Kingdom, Apr. 10, 1974, 15915/74
Int. Cl.² B08B *9/04*
U.S. Cl. 15—104.06 A **2 Claims**



1. A pipeline apparatus suitable for closing an open end of a pipeline and for carrying and individually launching two pipeline clearing spheres for clearing a pipeline comprising:

i. a first tubular member having a given diameter for longitudinally holding said pipeline spheres therein and having an open end for insertion into the open end of a pipeline and a closure opposite said open end;

ii. a second tubular member having a diameter from 0.7 to 0.98 that of said given diameter and positioned in said first tubular member for holding one of said spheres nearer the closure of said first tubular member, said second tubular member having a transverse closure and an open end;

iii. an outwardly radially expansible gripping and sealing means associated with said first tubular member and actuatable by a fluid under pressure to grip the inside of a pipeline and seal thereagainst;

iv. means for supplying said fluid to actuate said gripping and sealing means; and

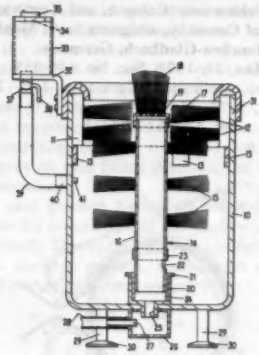
v. means for introducing compressed gas into the interior of said first and second tubular members at two longitudinally spaced apart locations to displace the spheres individually from the interior of the tubular members into the interior of a pipeline, the gas introduction location for said first tubular member being up to one given diameter from the first transverse closure and from ¾ to 1½ given diameters from the transverse closure of said second tubular member.

4,011,621
WASHING APPARATUS

Joseph James King Irvine, 10 Ebrington Gardens, Belfast BT4 3BY, Northern Ireland

Filed Oct. 15, 1975, Ser. No. 622,616
Int. Cl.² A47L *15/40, 15/44;* **B08B** *3/02*
U.S. Cl. 15—104.92 **3 Claims**

1. A washing apparatus for tumblers and the like comprising a container having an open top, inlet means in communication with the container for connection to an external supply of cleansing liquid to allow continuous flow from the supply into the container, a first stationary brush unit having a plurality of inwardly directed bristles and arranged peripherally on the container and a second stationary brush unit comprising an upright tubular member arranged centrally of the container and having a plurality of radially outwardly directed bristles, said tubular member having an open lower end in communication with said inlet means for passage of cleansing fluid into the tubular member, a top end which has a plurality of jet apertures therein, an aperture in the side of the tubular member adjacent the lower end thereof and adjustment means associated with said aperture in the side of the tubular member to vary the rate of flow of liquid through said aperture and

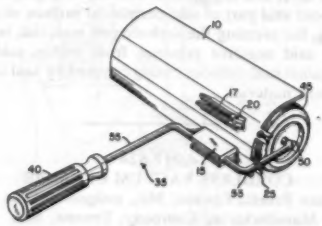


consequently to vary the force of cleansing liquid passing through the plurality of jet apertures.

4,011,622
ATTACHMENT FOR A ROLLER APPLICATOR

Charles A. Gillum, Hoffman Estates, and Theodore J. Kalata, Schaumburg, both of Ill., assignors to Kagil Corporation, Hoffman Estates, Ill.

Filed Oct. 14, 1975, Ser. No. 622,751
Int. Cl.² B05C *17/02*
U.S. Cl. 15—248 A **2 Claims**



1. An attachment for a roller pad paint applicator to prevent splattering of paint during the application by the paint roller, said paint roller having a handle portion, a cylindrical pad rotatable about a spindle, and an arm connecting said spindle to said handle, comprising:

a generally semi-cylindrical plastic shield curved about a central axis, and

a plurality of plastic clip means, integrally molded with said plastic shield, for attaching said shield to said arm so that the central axis of said shield is parallel with said spindle, each of said clip means circumferentially displaced with respect to the other clip means, each of said clip means comprising:

a slotted clip member formed integrally with said shield, extending radially from said shield, each slot positioned parallel to the central axis of said semi-cylindrical shield to allow said shield to be adjusted with respect to said paint roller by attaching said shield by individual ones of said clip means to said arm, and

an additional clip member positioned on an arcuate edge of said shield for attachment to said arm.

4,011,623

APPARATUS FOR MECHANICALLY REMOVING MOISTURE FROM WEB-FORMED MATERIAL

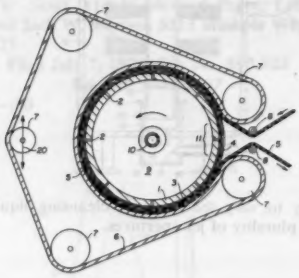
Manfred Pabst, Weiden near Cologne, and Kurt van Wersch, Wegberg, both of Germany, assignors to A. Monforts Maschinenfabrik, Monchen-Gladbach, Germany

Filed Jan. 21, 1976, Ser. No. 650,859

Claims priority, application Germany, Jan. 21, 1975, 2502149; Oct. 25, 1975, 2547917

Int. Cl.² A47L 5/38

U.S. Cl. 15—306 A **14 Claims**



1. Apparatus for continuously mechanically removing moisture from web-shaped porous material, comprising a drum having a cylinder casing formed with holes therein, said drum being subjectible to negative pressure from within said cylinder casing, a cover layer of absorbent material formed with penetrating capillaries and uniformly disposed over said cylinder casing, means for guiding the web-shaped material about a art of the peripheral part of said cylinder casing and said cover layer disposed thereon, whereby the moisture to be removed from the material is sucked through said capillaries and said holes and carried off with the aid of said negative pressure, an air-impermeable endless entrainer spaced from said cover layer and engageable with the web-shaped material guided about said part of said peripheral surface of said cylinder casing, for pressing the web-shaped material, in cooperation with said negative pressure from within said cylinder casing, against said cylinder casing covered by said cover layer of absorbent material.

4,011,624

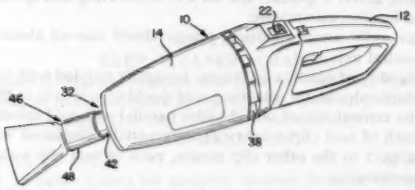
CORDLESS VACUUM CLEANER

Mark Anton Proett, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 25, 1975, Ser. No. 607,637

Int. Cl.² A47L 5/24

U.S. Cl. 15—344 **10 Claims**



1. A battery-operated electric vacuum cleaner comprising an electric motor; switch means for connecting said motor to a battery for energization thereof; a fan driven by said motor; a canister for retaining dirt picked up by the cleaner; a filter bag mounted in said canister and arranged to remove dirt from the air stream produced by said fan; and an intake for said canister, said intake comprising a passageway opening into said canister, said passageway having a substantially constant cross sectional area throughout its length; and a diffuser disposed at the outlet of said fan opening directly to the atmosphere for reducing back pressure across said fan and increasing the efficiency of said unit.

4,011,625

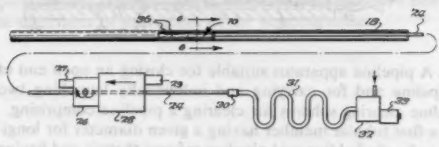
LANCE TIP CONSTRUCTION

Robert J. Goodwin, Hendersonville, N.C., assignor to C. H. Heist Corporation, Asheville, N.C.

Filed Sept. 8, 1975, Ser. No. 611,072

Int. Cl.² B08B 9/02

U.S. Cl. 15—104.1 R **25 Claims**



21. A tube cleaning lance tip construction for insertion into a tube comprising a body portion, bore means effectively located on one side of said body portion for causing liquid to be ejected with a net lateral force component to bias said body portion toward said tube, and blade means extending longitudinally of said body portion and extending toward the inside of said tube for removing deposits therefrom.

4,011,626

MEANS FOR POSITIONING A LONGITUDINAL BEARING

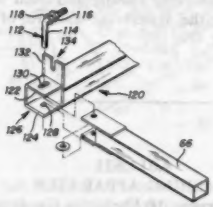
Roy L. Chandler, Tarrant County, Tex., assignor to L. Ray Wood, Arlington, Tex.

Division of Ser. No. 327,426, Jan. 29, 1973, Pat. No. 3,891,132. This application Apr. 7, 1975, Ser. No. 565,754

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² E05D 7/04

U.S. Cl. 16—129 **8 Claims**



1. Apparatus for adjusting the inclination of a bearing surface, comprising:

a. fixed structure having at least two spaced walls forming a groove therebetween, said groove providing access for a rotatable member which may be mated with the bearing surface;

b. an aperture in a first one of the walls;

c. a slot in the second of the two walls, the slot being opposite the aperture in first wall, and said slot extending in a direction which is generally perpendicular to the groove;

d. a flange extending away from the second wall in a direction perpendicular to the opening of the groove, and said flange having an opening which lies in the plane defined by the aperture in the first wall and the slot in the second wall;

e. an L-shaped member having a cylindrical bearing surface along a first leg and an irregular surface along the second

leg, with the first leg being adapted to engage the aperture and also to span the gap between the aperture and the slot, and the second leg being adapted to extend from the slot through the flange opening; and

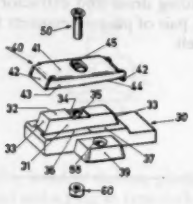
f. means for firmly securing the L-shaped member to the flange, including means for engaging the irregular surface on the second leg when said leg is inserted into the flange opening, and the inclination of the first leg with respect to the groove being adjustable in accordance with which portion of the second leg's irregular surface is utilized in securing the L-shaped member to the flange.

4,011,627

ADJUSTABLE HINGE COUPLING OR THE LIKE

Luciano Salice, Carimate, Italy, assignor to Arturo Salice SpA, Cantu (Como), Italy

Filed June 2, 1976, Ser. No. 692,116
Claims priority, application Italy, June 3, 1975, 21594/75
Int. Cl.² E05D *7/04*
U.S. Cl. 16—129 **10 Claims**



1. An adjustable coupling for interconnecting two relatively movable elements, comprising:

a base securable to one of said elements;

a cover engageable with said base and shiftable relatively thereto in a first dimension;

first fastening means for immobilizing said cover with reference to said base in a selected relative position;

a slider engageable with said cover and shiftable relatively thereto in a second dimension with limited relative mobility in a third dimension;

second fastening means for immobilizing said slider with reference to said cover in a selected relative position; and

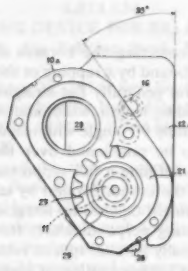
a connector securable to the other of said elements, said connector being displaceably joined to said slider.

4,011,628

HINGE MEANS FOR A PIVOTABLE WINDOW

Sigurd Walter Bengtsson, Bruksgatan 17, Goteborg, Sweden

Filed Oct. 1, 1975, Ser. No. 618,388
Claims priority, application Sweden, Oct. 4, 1974, 7412523
Int. Cl.² E05D *11/08*
U.S. Cl. 16—140 **8 Claims**



1. In a hinge means for a window comprising a casement and a frame pivotable about a horizontal axis with respect to said frame said hinge means including a link having first and second pivots at its opposite ends for attachment to the casement and to the frame respectively, as well as means interconnecting said first and said second pivots so as to cause a controlled turning movement of said frame in relation to said casement, the improvement of

attachment means at said first pivot, including a fitting rigidly connected to said first pivot and a fitting plate for attachment to the casement,

two hook members on said fitting, located one above the other and directed away from said first pivot,

two grooves on said fitting plate for the reception of said hook members,

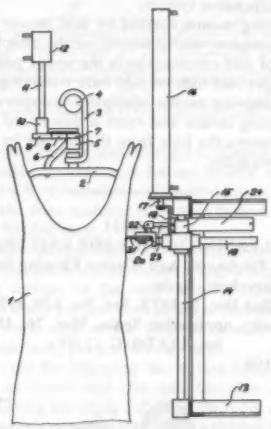
each of said grooves having an entrance portion, open towards the inward side of the window, and being mainly horizontally directed, as well as a mainly vertical, downwardly directed portion, forming an extension of the inward end of said entrance portion.

4,011,629

APPARATUS FOR TREATING AN ANIMAL CARCASS

Arne Laursen, Roskilde, Denmark, assignor to Slagteriernes Forskningsinstitut, Roskilde, Denmark

Filed July 11, 1974, Ser. No. 487,634
Claims priority, application Denmark, July 17, 1973, 3942/73
Int. Cl.² A22B *5/08*
U.S. Cl. 17—17 **6 Claims**



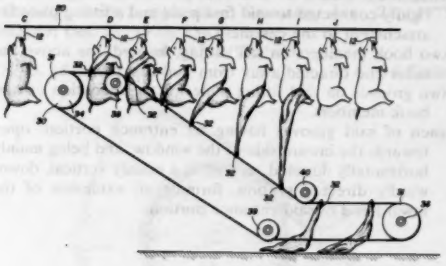
1. An apparatus for treating an animal carcass, particularly a slaughtered pig, vertically suspended in a rotatably and retainably mounted suspension device comprising, in combination, a holder for a tool to treat the animal carcass, means for mounting the tool on said holder for engagement with the outer surface of the animal carcass, means for guidably supporting said holder for reciprocating movement in a vertical direction and for concomitant movement in a horizontal direction adjacent the animal carcass, means for automatically moving said holder reciprocally in said vertical direction on said supporting means, means for automatically moving said holder yieldingly in said horizontal direction for resilient engagement of the tool in said holder with the outer surface of the animal carcass with a predetermined force throughout variations in the contour of the carcass outer surface during the movement of said holder in the vertical direction.

4,011,630

HOG SKINNING METHOD AND APPARATUS

Edward Ochylski, 9155 S. Pleasant, Chicago, Ill. 60620

Filed Jan. 7, 1974, Ser. No. 431,033
Int. Cl.² A22B *5/16*
U.S. Cl. 17—21 **27 Claims**



1. A method of skinning a hog comprising the steps of:

A. Suspending a hog carcass in a head-up position,

B. Freeing the hide from around the neck and head of the carcass, and

C. Grasping the freed hide at its upper end, and pulling downwardly on the hide to remove the hide from said carcass.

18. A hog dehider comprising:

A hog carcass suspension system adapted to suspend hog carcasses in the head-up position and move said carcasses through a dehider at an uniform speed;

a power driven hide removing means mounted adjacent to and below said hog carcass suspension system and adapted to move at the same horizontal speed as the hog carcass suspension system;

a hide grasping means carried by said power driven hide removing means, said grasping means adapted to grasp the hide of said carcasses near the upper portion thereof and connect said hide to said hide removing means;

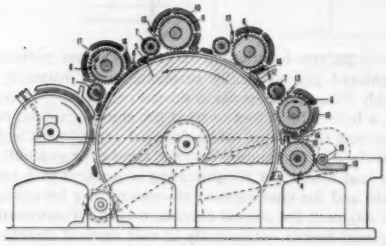
said hide removing means adapted to cooperate with said hide grasping means and exert a downward pull on said hide to remove the hide from the carcass by drawing the hide downwardly.

4,011,631

COMBING-CLEANING DEVICE FOR UNIVERSAL CARDS

Juan Barcons Estebanell, Avd. Doctor Fleming San Fructuoso de Bages, Barcelona, Spain

Filed Dec. 9, 1975, Ser. No. 639,017
Claims priority, application Spain, Mar. 26, 1975, 211105
Int. Cl.² D01G *15/04*
U.S. Cl. 19—100 **7 Claims**



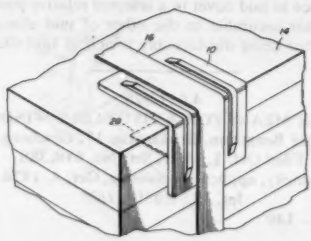
1. A comber-cleaner assembly for a carding device of the type including a rotatable carding drum having a first direction of rotation and provided with means for carrying a fibrous web on the surface thereof, a feed roller for taking up the fibrous web from a table and a takerin roller cooperating therewith to deliver the fibrous web on the drum surface, said comber-cleaner assembly comprising at least one assembly grouping of cooperating cylindrical rollers, including a rotatable worker roller and a rotatable stripper roller mounted in specific relation to the carding drum, the worker and stripper rollers being rotatable in the same direction which corresponds to a second direction relative to the rotational direction of the carding drum, the worker roller being mounted upstream of the stripper roller relative to the direction of rotation of the carding drum, a plurality of plaque segments partially surrounding the stripper roller, the worker roller including means for picking up the fibrous web from the carding drum and carrying the fibrous web on the surface thereof for delivery to the stripper roller, the stripper roller including means for carrying the delivered web on the surface thereof, the plaque segments including means on the interior surface thereof which cooperate with the stripper roller for cleaning and combing the fibrous web as it is carried on the surface of the stripper roller, the stripper roller having a path of rotation for redelivering the cleaned and combed fibrous web onto the carding drum and extractor blade means positioned between a pair of plaque segments for removing impurities from the web.

4,011,632

CORNER PROTECTOR FOR STRAPPED STACKS

Paul M. MacDonald, Scituate, Mass., assignor to PX Industries, Inc., Rockland, Mass.

Filed Aug. 20, 1975, Ser. No. 606,168
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 R **2 Claims**



1. A shield for protecting the corners of a stack of flat cartons and the like bound by strapping or the like, comprising

a. a pair of integral generally flat straight legs of substantially corresponding length, width and thickness oriented at an approximately 90° angle with respect to one another and adapted to be positioned over the corner of said stack, said legs defining a full supporting transverse surface at least at the corner formed by said legs, and

b. a single thin straight tapered lip integral with one of said legs and extending perpendicularly from the inner face thereof in generally parallel spaced relation to said other leg for insertion between adjacent cartons in said stack,

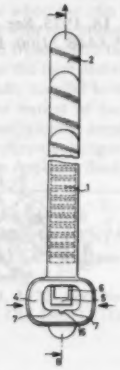
c. the inner face of said other leg being smooth and flat,

d. the outer faces of said legs being formed with a shallow channel extending in the direction of said legs.

4,011,633
CABLE BAND

Jürgen Seil, Norderstedt, Germany, assignor to ITW-Ateco G.m.b.H., Norderstedt, Germany

Filed Nov. 5, 1975, Ser. No. 629,175
Claims priority, application Germany, Nov. 29, 1974, 2456486
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB 2 Claims



1. A one-piece cable band of flexible plastic material comprising a toothed band and a plug-in type socket at its one end, said socket consisting of an elastically deformable frame which is oval shape, a funnel-shaped opening having an interlocking latch projecting into said opening with said opening adapted to receive the tooth band while the interlocking latch engages teeth on said band, the longitudinal axis of said oval opening is substantially longer than the width of the tooth band so that the frame may be compressed in the direction of the longitudinal axis to unlock the tooth band, the wall forming the opening opposite the interlocking latch being relieved throughout its length and intermediate its side extremities by a groove extending substantially parallel with the axis of the opening whereby said frame can be compressed and deformed, said interlocking latch includes a hook-shaped portion integral with the side of the frame facing toward the toothed band and extending obliquely from the end of introduction towards the opposite side of the frame, said interlocking latch further including a pair of skin-like portions connecting the side edges of the interlocking latch with the support side of the frame to provide a resilient spring-like action to said latch, the free end of said latch terminating a predetermined distance from the end of the opening opposite the end of introduction, said predetermined distance being at least equal to the spacing of adjacent teeth on said band.

4,011,634
LACING DEVICE FOR SKI BOOTS

Icaro Olivieri, 10, Via Feltrina Nord, Montebelluna, Italy (31044)

Filed June 25, 1976, Ser. No. 699,682
Claims priority, application Italy, July 4, 1975, 12686/75
Int. Cl.² A43C *11/00*; A43B *11/00*
U.S. Cl. 24—70 SK 6 Claims

1. In a ski boot of the type comprising a ski boot upper provided with two flaps defining an opening, a lacing device including a hooked lever-like lacing member provided on one flap and intended to cooperate with a ring-like lacing member on the other flap, anchoring means for securing at least one of said lacing members hingedly and in a removable manner onto the corresponding flap, with possibility of adjustment of the distance of the lacing member with respect to the said opening, said anchoring means comprising:

a. a slide guide element provided on the flap and presenting at least a guide arranged transversely with respect to the opening, said slide guide element presenting further at least two notches located at different distances with respect to the opening;

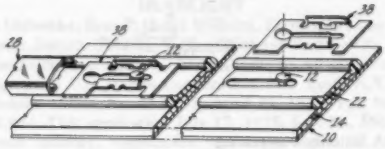
b. a carrier plate onto which there is hingedly mounted the lacing member, said carrier plate presenting at least a suitable engaging portion capable of slidably engaging the corresponding guide provided on the slide guide element;

c. a locking element provided on said carrier plate, and presenting at least a locking tooth or projection capable of engaging a notch located on the slide guide element.

4,011,635
RETAINER CLIP

Engelbert Anthony Meyer, Bloomfield Hills, MI, assignor to USM Corporation, Boston, Mass.

Filed Nov. 26, 1975, Ser. No. 635,677
Int. Cl.² A44B *21/00*; E04F *19/02*
U.S. Cl. 24—73 MF 12 Claims



1. A one-piece clip for assembling a U-shaped trim molding and an elongated flexible strip having beaded edge portions onto a panel surface provided with button headed stud fasteners, wherein the trim molding is located between the beaded edges of the flexible strip, comprising:

a body portion having disposed adjacent each end thereof a pair of oppositely directed feet lying in a plane parallel with the surface of the strip and extending outwardly from said body portion to a position contiguous with the bead at each edge of the strip to thereby substantially center said body portion on the strip;

resilient means for engaging the button head of said stud fastener to retain said clip and the strip adjacent the surface having the studs provided thereon; and

resilient means extending into said U-shaped trim molding and engaging the molding to retain and align the molding between the beaded edges of the flexible strip.

4,011,636
CLIP CONSTRUCTION

Joseph J. Malacheski, 130 E. Division St., Wilkes-Barre, Pa. 18702

Filed Mar. 12, 1976, Ser. No. 666,217
Int. Cl.² A44B *21/00*
U.S. Cl. 24—137 R 9 Claims

1. A clip construction comprising a generally upright back part for connection to a support, a resilient front part connected to and extending outwardly and upwardly from a lower region of said back part and thence inwardly and upwardly toward an intermediate region of said back part, and an entry

lip connected to and extending outwardly from the upper end of said front part, for downward insertion of an article between said back part and entry lip intermediate said back and front parts with the latter deflected forwardly and its end in gripping engagement with said article, said back and front

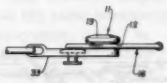
parts and entry lip extending laterally to define a laterally elongate overall configuration, and said front part and lip having a plurality of laterally spaced cutouts each extending downwardly through said lip and partially through said front part affording increased deflectability for ease of said article insertion.

4,011,637

DEMOUNTABLE SWIVEL FASTENER WITH DETENT

Harry E. Mazur, Box 4508, Palm Springs, Calif. 92262

Filed Nov. 21, 1975, Ser. No. 634,050
Int. Cl.² A44B *17/00*
U.S. Cl. 24—224 SS **3 Claims**



1. A fastener comprising:

a support,

a stud having one end mounted on said support and a shank extending substantially perpendicularly to a surface of said support and having at its opposite end a relatively enlarged head positioned at a predetermined spacing from said surface;

a clasp member having a thickness less than said spacing for confinement between said head and surface and formed with first and second openings respectively larger and smaller than said head and a passageway connecting said openings;

said smaller opening being formed in an end of said clasp member and sized to surround said shank between said head and surface to provide a free swiveling attached position on said shank;

said shank and passageway being formed to permit and to confine movement of said shank through said passageway along a single axis of lineal reciprocation between attached and detached positions in a predetermined angular position of said member on said shank;

means mounted on said support and providing a displaceable abutment movable into and from a position intersecting said axis and preventing and permitting respectively said axial reciprocation of said member and stud between attached and detached positions, said abutment in its axis intersecting position being positioned for engagement with said end for locking said member and stud in attached position;

means biasing said abutment to its said axis intersecting position; and

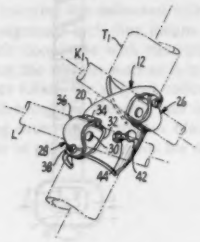
said first-named means being formed for manual engagement and displacement of said abutment from its said position against the action of said biasing means thereby permitting displacement of said member and stud between attached and detached positions.

4,011,638

JOINT CLAMP FOR JOINING INTERSECTING BRACE MEMBERS AND METHOD FOR MAKING SAME

Jack A. Holt, Belmont, and Philip A. Torbet, San Mateo, both of Calif., assignors to The Burke Company, San Mateo, Calif.

Filed Dec. 18, 1975, Ser. No. 642,180
Int. Cl.² A44B *21/00*; B25G *3/36*
U.S. Cl. 403—171 **5 Claims**



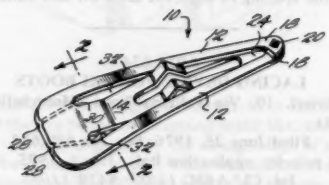
1. An article of manufacture for joining first and second brace members to an elongate cylindric support, said article comprising a substantially rigid body including a wall defining an axially extending cylindric passage having a diameter corresponding substantially to the diameter of said cylindric support, said body having first and second axially spaced ends and a helical slot extending therearound and opening through said ends, said slot making no more than one-half convolution around said body and opening through said axially spaced ends to define simicircular end segments of the body spaced from one another relative the longitudinal axis of the body by 180° or less, said slot having a width greater than the diameter of said cylindric support so that said support may be passed through said slot and into said body and then rotated into a position in parallelism with the body wherein the wall of the body snugly embraces said cylindric support.

4,011,639

CLIP

Otto Koleske, Sunbury, Pa., assignor to Wilson Manufacturing Corporation, Sunbury, Pa.

Filed Apr. 24, 1974, Ser. No. 463,807
Int. Cl.² A44B *21/00*
U.S. Cl. 24—255 H **3 Claims**



1. A clip, comprising:

a piece of flexible sheet material having a common base portion at one end; a center leg projecting from the base; and two outer legs projecting from the base in the same general direction as the center leg and flanking the center leg at the base; means connecting the outer legs together in laterally stressed condition, distally of the base, with the outer legs, as a corollary to their being connected,

being maintained closer together distally of the base than the width of the center leg at the same distance from the base, whereby the outer legs and base assume a concavo-convex condition which may be snapped to a reverse concavo-convex condition in order to bring the center and outer legs, distally of the base, alternatively into resilient mutual engagement, i.e. a "closed" condition, and substantial separation, i.e. an "open" condition;

said clip being provided with the improvement wherein: said base, on the face thereof from which the center leg curves toward the observer when the clip is in said open condition, being provided with two impressed bend lines which respectively proceed from where the two outer legs flank one another and join the base and extend generally longitudinally and generally parallel to one another across the base to the opposite extent of the base, the impressed bend lines being sufficiently strongly impressed as to produce visually apparent changes in the spatial disposition of the base on opposite flanks of each bend line.

4,011,640

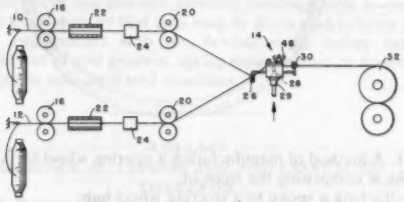
YARN ENTANGLEMENT NOZZLE

Jay Keith, Travelers Rest, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 20, 1975, Ser. No. 623,977

Int. Cl.² D02G 1/16

U.S. Cl. 28—1.4 **3 Claims**



1. A filament entangling air jet nozzle comprising: a body portion having a substantially planar surface, a cap portion having a substantially planar surface, means releasably securing said cap portion to said body portion with substantially all of the planar surface of said cap portion flush with the planar surface of said body portion and allowing said cap portion to be pivoted in a direction substantially parallel to the planar portion of said body portion when released, said body portion having a yarn slot therethrough, said cap portion having a yarn slot therethrough mating with the yarn slot of said body portion and an air orifice in said body portion communicating with said yarn slot in said body portion.

4,011,641

JACKETED ROLLER FOR SYNTHETIC YARN SPINNING APPARATUS

Yoshio Kitano, No. 40 Yamashina Nishino Rikyu-cho, Higashiyama, Kyoto, and Takuma Katsumata, No. 1-47, Oaza Takagami, Nakanosho, Inazawa, Aichi, both of Japan

Division of Ser. No. 314,419, Dec. 12, 1972, abandoned. This application Jan. 2, 1975, Ser. No. 538,213

Claims priority, application Japan, Dec. 17, 1971, 46-102895; May 30, 1972, 47-054191

Int. Cl.² D02J 1/22

U.S. Cl. 28—71.3 **3 Claims**

1. In an apparatus for spin drawing synthetic fiber, wherein a yarn is heat treated in successive stages on heated rollers each rotating at a speed higher than that of the preceding stage, the improvement comprising a jacketed, fluid-containing roller for the first stage of the successive stages of heated rollers, the jacketed roller comprising

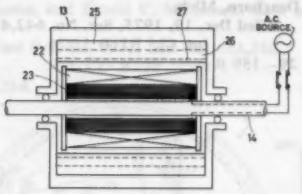
1. a shaft,

2. a fixed, non-rotatable inner core fastened about the shaft,

3. a roller rotatably mounted on the shaft and encompassing the inner core, the roller including

a. a tubular, electrically conductive member coaxial with, and hermetically affixed to, the inner wall of the roller, the conductive member having a higher electrical conductivity than the roller,

b. a tubular, non-magnetizable reinforcing member hermetically affixed to the inner surface of the conductive member,



c. a plurality of bore holes in the conductive member extending parallel to the axis of the roller and coextensive therewith,

d. a heat transfer fluid in each of the bore holes, the fluid dividing into a liquid and a vapor phase when the roller is heated and rotation of the roller forcing the liquid phase of the fluid radially outwardly under centrifugal force into engagement with the outer portion of each bore hole.

4,011,642

METHOD FOR MANUFACTURING A SEALED BEAMED HEADLIGHT

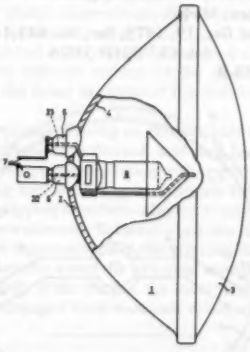
Klaus Meinecke, Brand; Dieter Wilhelm, Eschweiler; Leo Coir, Brand; Jurgen Tillack, Aachen; Helmut Samulowitz, Verlautenheide, and Karl Gebhardt, Stolberg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 463,198, April 22, 1974, Pat. No. 3,904,904. This application July 17, 1975, Ser. No. 596,956

Claims priority, application Germany, Apr. 28, 1973, 2321709

Int. Cl.² H01J 9/18, 9/36

U.S. Cl. 29—25.16 **4 Claims**



1. A method of manufacturing a sealed beam lamp which comprises: providing an outer envelope including a reflector, providing a transparent front glass, providing a quartz halogen lamp disposed within said envelope, providing an elongated member for supporting the halogen lamp relative to the envelope, positioning said elongated member relative to said reflector, passing current through the elongated member sufficient to raise the temperature, thereof and facilitate permanent deformation; align deforming the elongated member to

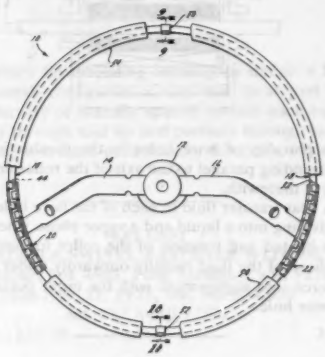
the said halogen lamp relative to said reflector thereafter moving said elongated member relative to said reflector to a second position for joining and then joining said reflector to said elongated member.

4,011,643

METHOD FOR MAKING A STEERING WHEEL

George H. Muller, Ann Arbor, and Warren A. VanWicklin, Jr., Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,412
Int. Cl.² B21D 53/26
U.S. Cl. 29—159 B 10 Claims



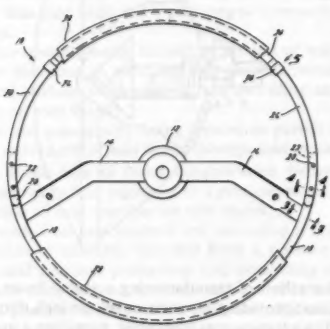
1. A method of manufacturing a steering wheel for a motor vehicle comprising the steps of:
attaching a spoke to a steering wheel hub;
forming a rim core by winding a metal member into a helix;
securing said rim core to said spoke with the axis of said helix coinciding with the axis of rotation of said steering wheel.

4,011,644

METHOD FOR MANUFACTURING A STEERING WHEEL

George H. Muller, Ann Arbor, and Warren A. VanWicklin, Jr., Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,413
Int. Cl.² B21D 53/26
U.S. Cl. 29—159 B 7 Claims



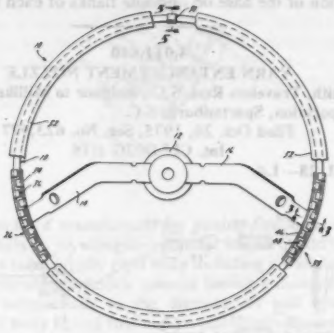
1. A method of manufacturing a steering wheel for a motor vehicle comprising the steps of:
attaching a spoke to a steering wheel hub;
forming a first rim core member having a substantially rigid body portion and end portions;
forming a second rim core member by winding a spring member into a helix;
severing said helical spring member to form an arcuate spring section;
securing the ends of said arcuate spring section to said end portions of said first rim core member;
securing the end of said spoke to said first rim core member;
covering said first rim core member and said arcuate spring section with a material providing a hand gripping surface.

4,011,645

STEERING WHEEL METHOD OF MANUFACTURE

George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,518
Int. Cl.² B21D 53/26
U.S. Cl. 29—159 B 6 Claims



1. A method of manufacturing a steering wheel for a motor vehicle comprising the steps of:
attaching a spoke to a steering wheel hub;
affixing a channel shape attachment member to the outer end of said spoke;
forming a flexible rim core from an annular leaf spring member;
fitting a portion of said rim core in said channel shape attachment member;
deforming said attachment member into gripping engagement with said rim core;
covering said rim core with a member having a hand gripping surface.

4,011,646

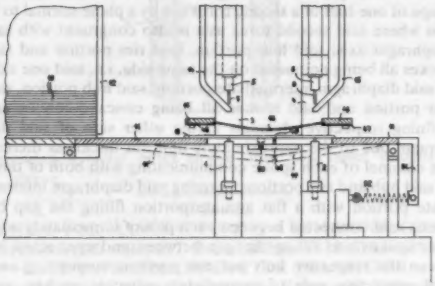
APPARATUS FOR ATTACHING FLEXIBLE PARTS AND/OR INNERSOLES WITH JOINT SPRINGS THROUGH RIVETING

Hans Mohrbach, Rieschweiler, Pfalz, Germany, assignor to Ernst Mohrbach KG, Germany

Filed Oct. 15, 1975, Ser. No. 622,680
Claims priority, application Germany, Oct. 26, 1974, 2450957
Int. Cl.² B23P 19/04; B23Q 7/10
U.S. Cl. 29—818 4 Claims

1. Apparatus for the connecting of flexible pieces such as innersoles, with shanks through riveting of the type having a stack and guide arrangement for the innersoles or flexible pieces, as well as a supply and guide arrangement for the rivets and two riveting devices for joining and riveting the two work pieces as well as a supply and guide arrangement for the shanks with a control for the release and carrying out of the different feeding and working operations, the improvement comprising a pair of magazines adapted to hold a stack of shanks therebetween, a pair of guide bars positioned below the magazines and adapted to receive a shank from the stack held within the magazines, each of said magazines containing

a hammer adapted to move toward each other to release the edges of the lowermost shank held in the magazines, each of said guide bars containing a guiding groove adapted to receive the edges of released shank, a movable slider for conducting individual shanks held between said grooves of the guide bars, to an end position of said grooves in which said shank is positioned above the flexible piece to which it is to be riveted, a pair of riveting devices adjacent the end position of the



grooves, each of said guide bars having a leaf spring at its end position forming the underside of the groove in that area whereby the shank in the end position in the grooves may be snapped out of said grooves, pivotally mounted table supporting the guide bars so that they may be depressed to bring the shank into contact with the flexible piece before being snapped out of said grooves, spring means biased to maintain the table in non-depressed condition.

4,011,647

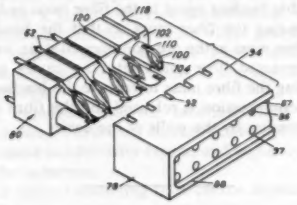
ELECTRICAL CONNECTOR AND CONTACTS THEREFOR

Carl W. Peterson, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 527,600, Nov. 27, 1974, Pat. No. 3,955,873, which is a continuation-in-part of Ser. No. 510,382, Sept. 30, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 641,094

Int. Cl.² H01R *43/04*

U.S. Cl. 29—750 **5 Claims**



1. A tool for inserting an insulated conductor into a terminal device having a tubular section with first and second longitudinally extending slots therein on opposite sides thereof each extending to the rear of said tubular section with one of said slots extending to the forward end of said tubular section, comprising:

an elongated hollow body having a cylindrical bore therein extending to one end of said body;

a cylindrical pin centrally mounted within said bore and spaced from the wall of said bore defining an annular space therebetween, said space being dimensioned to slidably receive said terminal device thereinto;

said one end of said body being chamfered to provide an inclined front face extending at an acute angle with respect to the longitudinal axis of said body;

a slot extending across said inclined front face from the forward portion of said face to the rearward portion thereof, said slot being dimensioned to

snugly receive said insulated conductor therein; and

the forward end of said pin terminating adjacent to the bottom of said slot.

4,011,648

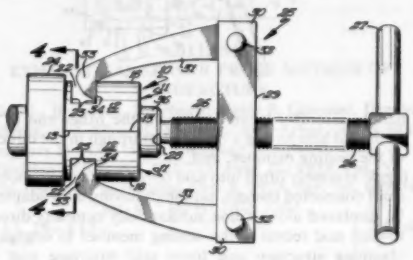
BEARING PULLER DEVICE

Milton Martinson, and Ernest C. Michelson, both of Ashby, Minn.

Filed Dec. 22, 1975, Ser. No. 643,310

Int. Cl.² B23P *19/04*

U.S. Cl. 29—264 **3 Claims**



1. A bearing puller device for use in forceably pulling an inner bearing race sleeve from eccentric engaging relation with a shaft, the bearing having an annular groove therein, said bearing puller device comprising

a pair of semi-cylindrical sleeve elements having elongate straight longitudinal edges, and adapted to be positioned around and in clamping relation with the inner race of a bearing, the longitudinal edges of the sleeve elements engaging each other when the sleeve elements are disposed in clamping relation with the bearing race,

each sleeve elements having a pair of arcuate flanges, each flange extending rigidly inwardly from one end of the associated sleeve element, the radius of the flange at one end of each sleeve element being greater than the radius of the flange at the other end, the flange at one end of each sleeve element engaging in the groove of the bearing when the sleeve elements are disposed in clamping relation with the bearing race,

a rigid cylindrical collar being dimensioned to slide over and engage the exterior surface of the sleeve elements for retaining the latter in clamped relation with the bearing race,

each sleeve element having an elongate slot therein extending circumferentially thereof, said slots being disposed in diametrically opposed relation with respect to each other,

and a pulling tool including an elongate handle, a pair of elongate gripping members adapted to engage in the slots of the sleeve elements to thereby grip the sleeve elements, and means interconnecting the gripping members with a handle whereby when the gripping members are moved longitudinally of the handle, the inner race of the bearing will be disengaged from mounted relation on the shaft.

4,011,649

CLIP LOCK CLAMPING TOOL

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,804

Int. Cl.² B23P *19/04*

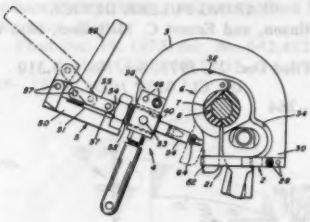
U.S. Cl. 29—267 **5 Claims**

1. A clamping tool for disposing a resilient clip having two leg portions each with inwardly directed extensions thereon over a clamping structure adapted to be secured together by

forcing said extensions of said clip over mating ledges on said structure comprising:

a seating member having a recess therein adapted to engage the head of the clip to be applied to the clamping structure,

a generally C-shaped arm connected at the one end thereof to said seating member,



a handle assembly located adjacent the other end of said C-shaped arm having a bore therethrough in the direction of the seating member, and

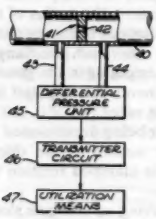
a toggle assembly fitted into said bore and having a movable shaft connected thereto, said shaft having a tip adapted to be displaced along a line substantially centrally directed toward said recess in the seating member to engage the clamping structure and force said structure past said extensions of said clip.

4,011,650

COLD WORKING PROCESS

Richard Paul Granada, West Covina, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,036
Int. Cl.² B23P *17/00*
U.S. Cl. 29—421 R **5 Claims**



1. The method of making a force sensitive member comprising the steps of: forming a generally planar thin circular metal diaphragm with a generally symmetrical center and an axis through said center normal to the diaphragm plane; forming said diaphragm with a flat circular portion around said center and a flat annular portion at its outer edge between an inner circle and an outer circle concentric with said inner circle; forming said diaphragm with said annular portion is a position such that both of said circles are concentric with said diaphragm axis; forming said diaphragm in a manner such that said outer circle has a predetermined diameter; forming said diaphragm with a thickness that is substantially less than said outer circle diameter; forming said diaphragm with an intermediate portion connected between said circular and annular portions thereof; embossing said diaphragm on one side thereof to provide a wheel-shaped embossment on said one side thereof; relieving said diaphragm on the side thereof opposite said one side; embossing said diaphragm in a manner to provide a hub portion, a rim portion and a plurality of spokes within said embossment; embossing said diaphragm in a manner to cause said hub portion to be connected from said diaphragm circular portion to said spokes; embossing said diaphragm in a manner to cause said hub portion to have a surface in the shape of one-half of a first torus cut by a plane normal to its axis where said first torus axis is congruent with said diaphragm axis; embossing said diaphragm in a manner to cause said rim portion to be connected from said spokes to said diaphragm annular portion and said rim portion to be spaced radially from said hub and to have a surface in the shape of one-half of a second torus cut by a plane normal to its axis where said second torus axis is also congruent with said diaphragm axis; said hub portion, said rim portion and said spokes all being embossed on the same side, i.e. said one side, of said diaphragm intermediate portion; said hub portion, said rim portion and said spokes all being concavo-convex and defining respective channels in the other side of said diaphragm due to the approximately uniform thickness thereof; the channel of each spoke communicating with both of those of said hub and rim portions; forming said diaphragm intermediate portion with a flat arcuate portion filling the gap between said connected between each pair of immediately adjacent spokes and filling the gap between and connected between the respective hub and rim portions connecting each said respective pair of immediately adjacent spokes; said spokes being uniformly distributed around and projecting in radial directions from said diaphragm axis; and holding said diaphragm annular portin while applying a force against the center of said diaphragm approximately normal thereto on said opposite side thereof of a magnitude sufficient to stretch said diaphragm beyond the yield point thereof.

4,011,651

FIBRE MASSES

John Albert Avery Bradbury, and Matthew Giles Kendall, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1974, Ser. No. 444,963
Claims priority, application United Kingdom, Mar. 1, 1973, 10013/73; Jan. 28, 1974, 3941/74
Int. Cl.² B23P *17/00*
U.S. Cl. 29—424 **15 Claims**

1. A method of constructing an assembly comprising an insulating mass of polycrystalline inorganic fibre within a cavity which comprises pre-compressing the fibre mass to a bulk density of 2 to 20 times its original bulk density by applying a removable binding agent to the fibre mass and mechanically compressing the fiber mass so that the binding agent retains the fibre mass in the pre-compressed state, introducing the pre-compressed fibre mass into the cavity and subsequently heating the fibre mass to remove the binding agent so that the pre-compression is released and the fibre is retained under compression by the walls of the cavity.

4,011,652

METHOD FOR MAKING A PIPE COUPLING

Bobby E. Black, Chatsworth, Calif., assignor to PSI Products, Inc., Burbank, Calif.

Filed Apr. 29, 1976, Ser. No. 681,423
Int. Cl.² B21D *39/00;* **B23P** *19/04*
U.S. Cl. 29—455 R **9 Claims**

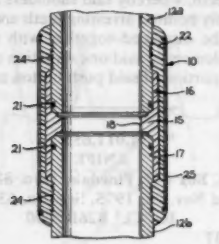
1. A method for making an insulative pipe coupling comprising the steps of:

forming an o-ring circumferential groove adjacent the end of two pipe stubs;

inserting an o-ring onto each of said grooves;

inserting said pipe stub ends with said o-ring into a center insulating sleeve;

injection moulding an outer insulative sleeve over said center sleeve and said pipe ends; and



pressing a metal outer sleeve onto said outer insulative sleeve.

4,011,653

METHOD FOR MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING AN INSULATING GATE TYPE SEMICONDUCTOR TRANSISTOR

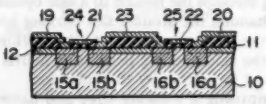
Taketoshi Kato, Yokohama, and Norio Kobayashi, Yokosuka, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 409,721, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 282,567, Aug. 21, 1972, abandoned. This application July 25, 1975, Ser. No. 598,758

Claims priority, application Japan, Aug. 23, 1971, 46-63649

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **6 Claims**



1. A method for manufacturing a semiconductor integrated circuit comprising the steps of:

forming a first insulating layer on a semiconductor substrate of one conductivity type;

etching, with a first mask plate having, a predetermined transparent and opaque mask pattern the insulating layer to expose a surface part of the substrate and to leave separated parts on the substrate where gate insulators are to be formed, said first mask plate having separated opaque sections corresponding to said separated parts on the substrate;

diffusing impurities into the substrate from the exposed surface thereof to form a current leakage preventing layer of the same conductivity type as and higher concentration than the substrate;

forming a second insulating layer on the exposed surface of the substrate;

etching the insulating layers to expose surface portions of the substrate;

diffusing impurities from the exposed surface portions into the substrate to form source and drain regions of at least two field effect transistors such that portions of said source and drain regions underlie said first insulating layer, the current leakage preventing layer surrounding the transistors and contacting the regions of the transistors;

etching, for each transistor and with a second mask plate having substantially the same mask pattern as said first mask plate but with the transparent and opaque portions of said mask plates reversed with respect to each other, the part of the first insulating layer between and on the part of the source and drain regions of each individual transistor to form for each transistor an opening exposing a surface part of the substrate having the same dimensions as said separated parts, said second mask plate being oriented relative to said substrate in substantially the same manner as said first mask plate such that the transparent portions of said second mask plate are aligned with the portions of said substrate that were aligned with the opaque portions of said first mask plate;

forming a gate insulator on the exposed surface part between the source and drain regions, the gate insulator also extending beyond the adjacent edges of the source and drain regions and being in at least partial overlapping relationship therewith; and

forming a gate electrode on the gate insulator, the gate electrode being in at least partial overlapping relationship with the source and drain electrodes.

4,011,654

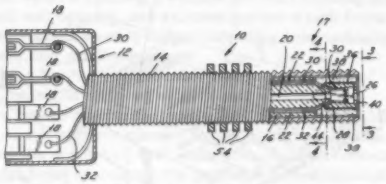
EXHAUST GAS SENSOR PROBE METHOD OF MANUFACTURE

Gordon L. Beaudoin, Dearborn; Dante S. Giardini, Dearborn Heights, and Allen H. Meitzler, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 483,723, June 27, 1974, Pat. No. 3,936,794. This application Oct. 3, 1975, Ser. No. 619,342

Int. Cl.² H01C *7/02, 7/04*

U.S. Cl. 29—612 **2 Claims**



1. A method of forming an exhaust gas sensor support member comprising the steps of:

extruding an elongated tube of green alumina ceramic material;

providing the tube with a plurality of substantially parallel longitudinally extending through passages;

prefiring the tube until the green ceramic is machinable;

machining one end of the tube of machinable green ceramic to form a cup-shaped end portion having a threaded outer surface;

providing the inner surface of the cup-shaped end portion with a pair of transversly disposed confronting longitudinally extending sensor receiving slots;

inserting a wafer of sensor material into the sensor receiving slots; and

final firing the tube.

4,011,655

EXHAUST GAS SENSOR PROBE METHOD OF MANUFACTURE

Gordon L. Beaudoin, Dearborn; Dante S. Giardini, Dearborn Heights, and Allen H. Meitzler, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 483,723, June 27, 1974, Pat. No. 3,936,794. This application Oct. 3, 1975, Ser. No. 619,343

Int. Cl.² H01C *7/02, 7/04*

U.S. Cl. 29—612 **3 Claims**

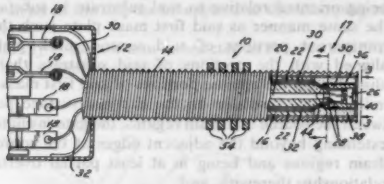
1. A method of forming an exhaust gas sensor support member comprising the steps of:

extruding an elongated tube of green alumina ceramic material;

providing the tube with a plurality of substantially parallel longitudinally extending through passages;

prefiring the tube until the green ceramic is machinable;

machining one end of the tube of machinable green ceramic to form a cup-shaped end portion having a threaded outer surface;



providing the inner surface of the cup-shaped end portion with a pair of transversly disposed confronting longitudinally extending sensor receiving slots; and

final firing the tube.

4,011,656

HAIR CUTTER

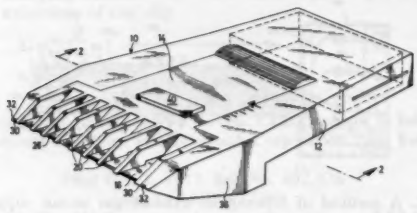
Christa Liedtke, Weg zur Platte 72, 43 Essen-Bredeney, Germany

Filed June 20, 1975, Ser. No. 588,986

Claims priority, application Germany, June 26, 1974, 2430650

Int. Cl.² B26B *21/12*

U.S. Cl. 30—30 **5 Claims**



1. A hair cutter comprising:

a blade carrier plate formed with a recess;

a cover plate;

guiding means for displaceably guiding said cover plate in said recess between two end positions, said guiding meand permitting displacement of said cover plate relative to said blade carrier plate only in one direction along said recess;

at least one blade having a blade cutting edge interchangeably retained between said blade carrier plate and said cover plate, said cover plate having a row of teeth which project beyond the cutting edge and are adapted when drawn through the hair to orientate the hair in the manner of a comb, and to engage the hair in operation perpendicularly relative to said blade cutting edge, the cutting length being adjustable upon displacement of said cover plate relative to the blade carrier plate in said one direction along said recess so as to change the length of projecting of said row of teeth over said blade cutting edge;

inwardly pointed arresting teeth being mounted on a flanged downwardly facing side of said blade carrier plate;

a push button actuating element having a projecting portion projectingly extending through a complementary opening formed in said cover plate and slidably mounted therein for displacement of said push button actuating element relative to both the cover plate and the blade carrier plate in a second direction transverse to said one direction, said push button actuating element having laterally extending shoulders with upwardly pointing arresting teeth for operatively engaging said inwardly pointed arresting teeth of said blade carrier plate so as to arrest and define a desired cutting length;

spring means for biasing said push button actuating element in the arresting position with its upwardly pointing arresting teeth operatively engaging said inwardly pointed arresting teeth, whereby said shoulders are released from said inwardly pointed arresting teeth and said cover plate is free to be displaced together with said push button actuating element in said one direction upon pushing said projecting portion of said push button actuating element.

4,011,657

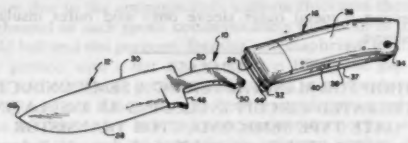
KNIFE

Larry F. Vance, Box 447, Pinedale, Wyo. 82941

Filed Nov. 21, 1975, Ser. No. 634,228

Int. Cl.² B26B *5/00*

U.S. Cl. 30—337 **9 Claims**



1. A knife accommodating interchangeable blades comprising:

a handle for a blade, the handle comprising:

a hand gripping portion having a keyway at the forward end of the handle, the keyway receiving the base of the blade; and

an arcuate slot for receiving a dimensionally corresponding arcuate tang, the slot having a forward opening in the keyway at the forward end of the handle and extending through the handle to a side opening in the side of the handle, the arcuate slot curving toward the side of the handle corresponding to the working edge of the blade, the side opening permitting debris in the slot to be forced therefrom by the tang; and

a blade comprising a working edge and having an arcuate tang extending from the base of the blade, the tang curving toward the working edge of the blade and being dimensionally configurated to be received in the slot in the handle, the base of the blade being received in the keyway.

4,011,658

DEVICE FOR INSERTING DENTAL FLOSS THROUGH INTERPROXIMAL AREAS AND METHOD OF USING SAME

E. B. Tarrson, Chicago, Ill., and R. Young, Bowmanville, Canada, assignors to John O. Butler Company, Chicago, Ill.

Continuation of Ser. No. 264,171, June 19, 1972, Pat. No. 3,929,144. This application Oct. 20, 1975, Ser. No. 624,037

Int. Cl.² A61C *15/00*

U.S. Cl. 32—40 R **7 Claims**

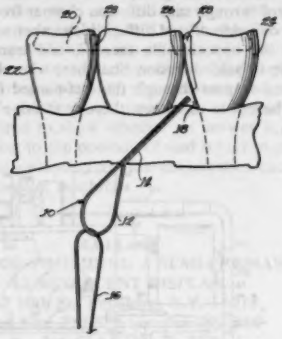
1. A method of threading a long filament through an interstice comprising the steps of:

a. forming a relatively large looped portion of soft and flexible material of fine diameter joined together to form a unitary elongated guide member adjacent to and integral with said loop, said material being soft and flexible enough to deform and fit through said interstice and thereafter springing back into the shape of the original large loop form;

b. threading said long filament through said large looped portion;

c. projecting said guide member through said interstice and pulling said guide until said loop and long filament pass completely through said interstice, whereby said loop may be relatively large to eliminate all threading problems and yet extremely flexible so that the loop may be

deformed to be no larger in diameter than the interstice which it passes through, thereafter returning to its normal diameter; and



d. removing said looped portion from its threaded association with said long filament.

4,011,659

CENTERING APPARATUS

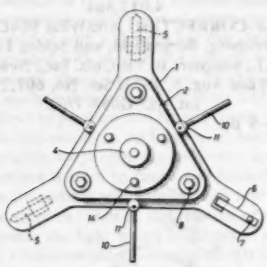
Torgny William Hörvallius, Gavle, Sweden, assignor to Aktiebolaget SAMEFA, Stockholm, Sweden

Filed Apr. 16, 1975, Ser. No. 568,732

Claims priority, application Sweden, Apr. 23, 1974, 7405412

Int. Cl.² G01B 5/24

U.S. Cl. 33—203 **9 Claims**



1. An apparatus for adjustment of a cylindrical holder into coaxial relation to a rotatable body, which holder is intended to be used in conjunction with measuring equipment for checking the direction or position of the rotatable body, comprising:

a base member having a flat surface and adapted to be attached to the body to be checked, or to a part rigidly secured to said body, e.g. a vehicle wheel, with said flat surface transverse to the rotational axis of said body;

an intermediate member mounted substantially concentrically on the base member, displaceable along said flat surface of said base member, and having guide means including a portion at least in part spherically shaped fixed thereon; and

said cylindrical holder being in turn mounted on said intermediate member, said cylindrical holder including a socket means slidably and tiltably receiving said spherically shaped portion of said guide means for permitting tilting of said cylindrical holder about said spherically shaped portion.

4,011,660

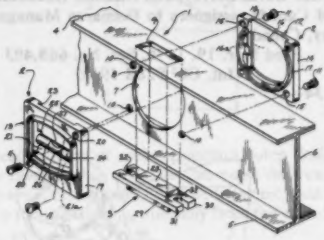
SPIRIT LEVEL WITH TOP WINDOW MOUNTING

George A. Johnson, Mequon, Wis., assignor to Johnson Products Company, Inc., Milwaukee, Wis.

Filed Mar. 29, 1976, Ser. No. 671,584

Int. Cl.² G01C 9/28

U.S. Cl. 33—379 **8 Claims**



1. A spirit level comprising, in combination:

a. a frame having a web and at least one longitudinal flange disposed on an edge of said web,

b. said web having an opening disposed therein, and said flange having a window opening disposed therein adjacent to and continuous with said web opening,

c. a window element having a window portion disposed in said window opening, a window portion extending toward said web opening, and a central portion which forms first and second locating ledges extending longitudinally beyond said window portions,

d. and a bubble vial assembly comprising a pair of cases mounted on opposing sides of said web opening,

e. the first of said cases engaging said first locating ledge to hold said window element tightly against said flange,

f. and the second of said cases and said second locating ledge being spaced apart to provide for adjustment of said second case parallel to the plane of said web, said second case having a bubble vial mounted thereon.

4,011,661

POWDERED EMULSION PRODUCT AND METHOD OF PRODUCTION

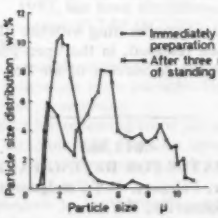
Hitoshi Sezaki, and Shozo Muranishi, both of Kyoto, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 519,048, Oct. 29, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,843

Claims priority, application Japan, Oct. 30, 1973, 48-121929; Oct. 30, 1973, 48-121930

Int. Cl.² F26B 7/00

U.S. Cl. 34—12 **6 Claims**



1. A method of preparing a powdered product suitable for preparing an emulsion which comprises: dispersing at least one substance selected from (a) a solution of a drug or nutriment in oil, or (b) an emulsion of an aqueous solution of a drug or nutriment in oil, in an aqueous solution containing 0.5–10.0% by weight of a surface layer former based on the

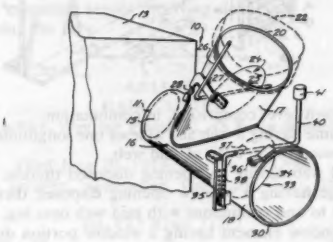
total weight of oil and water and thereafter spray-drying the dispersion.

4,011,662

AUTOMATIC VALVE ASSEMBLY AND HEATER/HUMIDIFIER CONVERTER FOR CLOTHES DRYER

Howard Coe Davis, Surrey, and Nicholas Hoolsema, Langley, both of Canada, assignors to Delmarco Management Ltd., Langley, Canada

Filed Mar. 19, 1976, Ser. No. 668,493
Int. Cl.² F26B *19/00*
U.S. Cl. 34—90 **14 Claims**



1. An automatic valve assembly for use with a clothes dryer having an exhaust opening within a building, the valve assembly communicating with an inlet duct which is connected to the dryer exhaust opening, and dividing at a duct junction into first and second exhaust ducts; the first exhaust duct exhausting into the building, carrying a filter and having a manual valve adapted to close or open the first duct; the second exhaust duct exhausting outside the building and carrying the automatic valve assembly; the automatic valve assembly being characterized by:

i. a valve plate mounted for rotation about a hinge axis between closed and open positions, the plate having a central axis which divides the plate into two generally equal areas, the hinge axis being parallel to and spaced from the central axis to journal the plate off-centered so that when the plate is exposed to a predetermined flow of air a force on the plate is generated which tends to swing the plate towards the open position,

ii. releasable latch means cooperating with the plate to hold the plate closed until a predetermined excessive exhaust pressure is developed on an upstream side of the plate due to restriction of exhaust flow through the filter in the first exhaust duct,

iii. pressure sensing means exposed to exhaust pressure on the upstream side of the valve plate and cooperating with the latch means to release the latch means when the exhaust pressure exceeds the predetermined excessive pressure,

iv. steadying means cooperating with the plate to maintain the plate, when released, in the open position in which there is negligible restriction of air flow past the automatic valve.

4,011,663

APPARATUS FOR DRYING FABRICS

Richard E. Moyer, Fairport, N.Y., assignor to Synchro Systems, Inc., St. Johnsville, N.Y.

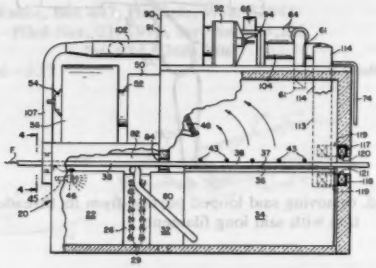
Filed Aug. 6, 1975, Ser. No. 602,209
Int. Cl.² F26B *13/02*
U.S. Cl. 34—155 **10 Claims**

1. Apparatus for drying wet fabrics, comprising

a machine frame having therein a preheat chamber communicating with an entrance to said frame, and a diffusion chamber, communicating with an exit from said frame,

means for advancing a strip of wet fabric in a plane successively through said entrance, and preheat chamber, said diffusion chamber and said exit,

means for circulating superheated steam from a supply thereof through said diffusion chamer from an inlet adjacent one side of said diffusion chamber to an outlet adjacent the opposie side thereof, and transversely of the fabric in said diffusion chamber, whereby the steam is caused to pass through the last-named fabric from one side hereof to the other, thereby to drive moisture therefrom,



said circulating means including means for recirculating said steam back to said supply the steam has passed through said fabric, and

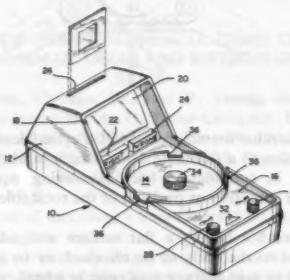
duct means opening on said diffusion chamber at said one side of the fabric and directly connecting said diffusion chamber to said preheat chamber to feed part of the steam which enters said diffusion chamber to said preheat chamber before the last-named steam has passed through any fabric in said diffusion chamber.

4,011,664

SELF-CORRECTING ANSWER MACHINE

Myron D. Weisberg, Bergenfield, and Selden Levy, Rivervale, both of N.J., assignors to Vis-Quiz, Inc., New York, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,276
Int. Cl.² G09B *7/02*
U.S. Cl. 35—9 B **6 Claims**



1. A visual self-correcting answer machine in which questions are presented to a user and the user indicates whether the answer is TRUE or FALSE, there being provided means for indicating whether the user's answer is RIGHT or WRONG, said answer machine comprising a cabinet housing the components of said answer machine therewithin, a rotary dial plate mounted on said cabinet for receiving a circular question card containing questions printed thereon to be answered by the user, a question indicating area on said cabinet indicating the question to be answered, a pair of depressible switch means designating the choice of a TRUE or FALSE answer by the user, RIGHT and WRONG visual indi-

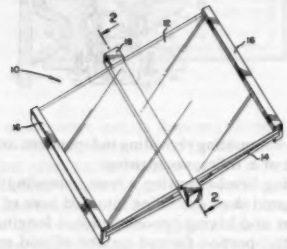
cations, electrical circuit means cooperatively keyed and connected to said rotary dial, to said pair of depressible switch means and to said visual indicators to indicate whether the user's answer of TRUE or FALSE was RIGHT or WRONG, wherein said rotary dial and said circular card comprises cooperating members enabling said card to be placed on said dial in only one spatial orientation wherein said electric circuit means comprises a rotary multiposition switch operated by said dial and having a plurality of positions corresponding to the number of questions on said card, said multiposition switch being wired to show whether an answer is TRUE or FALSE according to the position of said rotary multiposition switch, such that a plurality of different question cards can be used with said answer machine.

4,011,665

DEVICE FOR PROVIDING A SEMI-PERMANENT LUMINESCENT DISPLAY

Lillian Port, 532 10th St., Brooklyn, N.Y. 11215

Filed Nov. 2, 1973, Ser. No. 412,186
Int. Cl.² B43L *1/12*
U.S. Cl. 35—66 **16 Claims**



1. A display device for providing a semi-permanent luminescent display comprising a first sheet of substantially transparent material provided with a fluorescent dye dispersed therethrough and provided with at least one smooth major surface; a dispersive second sheet of material having at least one smooth major surface disposed adjacent to and coextensive with said first sheet to position said respective smooth surfaces of said sheets in opposition to each other, at least one of said sheets being pliable to permit the selective application of pressure on portions thereof to cause said smooth surfaces to come into intimate contact with one another and to cause the same to adhere to each other in the regions of said selected portions to disperse the light which impinges at said portions and to result in a luminescent effect, said sheets being separable from one another to terminate the intimate contact at the interface between said smooth surfaces at the selected portions and terminate the luminescent effect.

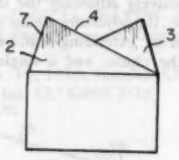
4,011,666

SOLE PATTERN FOR SHOES

Gerhard Karl Lehmann, Vordingborg, Denmark, assignor to A/S Jac. Engelbredt, Vordingborg, Denmark

Filed Aug. 21, 1975, Ser. No. 606,526
Claims priority, application Germany, June 27, 1975, 7520546
Int. Cl.² A43B *23/28*
U.S. Cl. 36—59 C **6 Claims**

1. A sole pattern for shoe soles of elastic yielding material, comprising: a plurality of rows of projections extending across said sole generally perpendicular to the longitudinal axis of the sole, each of said rows comprising a plurality of pairs of separate, spaced projections whose cross section decreases in a direction at right angles away from the sole, wherein the two projections of each pair are associated in such a way that the tread surface of one projection is sloped inwardly toward the sole and lies in an inclined plane extending transversely of the sole, and the tread surface of the other projection is also sloped inwardly toward the sole and lies in a second inclined plane extending transversely of the sole, said first and said second mentioned inclined planes being oppositely directed,



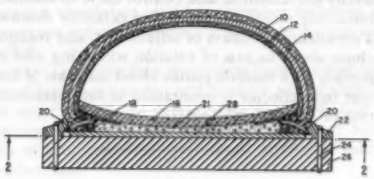
and the tread surface of each projection being defined by a pair of side faces, and an end face that meets the tread surface to form an apex, at least said end face being inclined inwardly relative to a plane extending normally from the surface of said sole.

4,011,667

SAFETY SHOES

Wirt G. Greenan, Wakefield, Mass., assignor to Safety Box Toe Company, Wakefield, Mass.

Filed June 28, 1976, Ser. No. 700,101
Int. Cl.² A43C *13/14*
U.S. Cl. 36—77 R **8 Claims**



1. A safety box toe system comprising a welt shoe, a flangeless box toe of crush-resistant material mounted beneath the upper, a stress-absorbing plate disposed beneath the insole, aligned with the lower edge of the box toe and having its periphery lying adjacent the inseam line, and an outsole of resilient material.

4,011,668

ADJUSTABLE DEFLECTOR FOR SNOW REMOVAL MACHINE

Ralph R. Gunderson, 8212 S. Homan, Chicago, Ill. 60652

Continuation-in-part of Ser. No. 337,918, March 5, 1973, Pat. No. 3,879,866. This application Mar. 3, 1975, Ser. No. 554,539
The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.
Int. Cl.² E01H *5/04*
U.S. Cl. 37—43 R **5 Claims**

1. In a snow removal machine, an adjustable snow directional device for directing snow particles forwardly and laterally of the machine, comprising:

an upright chute for receiving snow particles from the machine and directing said particles upwardly to an open upper end of said chute, said chute being rotatable about an upright axis of rotation;

a deflector pivoted to the chute for swinging movement between an upper position and a lower position, the deflector being positioned transversely of the open upper end of the chute to intercept and to redirect snow particles outwardly of the open upper end of the chute, the swinging movement of the deflector between said upper and lower positions varying the direction of the path of snow particles from the chute;

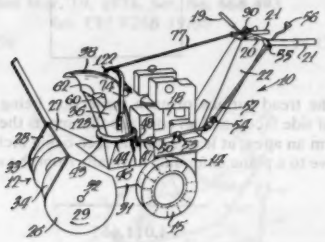
retracting means normally urging the deflector toward said upper position;

a support bracket;

a stationary surface carried by the bracket;

means for mounting the bracket to position the bearing surface on the axis of rotation of the chute; and

means for selectively adjusting the deflector toward said lower position, the adjusting means including lever means on the deflector extending transversely of the axis of rotation of the chute, and a single, elongated, flexible



control cable extending to a control station, said control cable having an attaching portion secured to said lever means and passing rearwardly over the bearing surface on the bracket,

whereby movement of said control cable to counteract said retracting means will pivot said deflector downwardly to a preselected position of adjustment, and rotation of the chute about its axis of rotation will swing said attaching portion on a uniform radius about said axis of rotation so that the deflector is maintained in said preselected position of adjustment during said rotation.

4,011,669

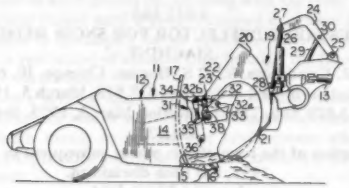
POWER SCRAPER WITH APRON ON A MOVABLE PIVOT AXIS

Ray H. Hahn, Dunlap, and Larry G. Eftefield, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 24, 1975, Ser. No. 644,231

Int. Cl.² E02F *5/00*

U.S. Cl. 37—126 AD **10 Claims**



1. An improved apron operating means for a power scraper which includes a tractor and a scraper with a bowl that has sidewalls and a floor provided with a forward cutting edge, and an apron mounted for movement about a pivot axis near the top of the scraper between an initial, elevated, unloading position, a closed position with its lower edge against the bowl floor immediately adjacent the cutting edge, and an intermediate loading position with said lower edge in a plane above the cutting edge, said operating means comprising, in combination:

hydraulic cylinder means pivotally connected to the scraper and to the apron for moving the apron about said pivot axis between its elevated position and its closed position; and translating means operatively connecting the apron to the sidewalls of the bowl for automatically and continuously shifting said pivot axis a short distance downwardly from an initial position during the entirety of said moving the apron about the pivot axis so that the path of the lower edge of the apron from elevated position toward intermediate position is forward of an arc of a circle struck about said initial positon of the axis, and said path from intermediate position to closed position is below said arc.

4,011,670

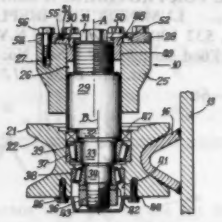
ROLLER MOUNTING

James P. Hutchings, Coal City, and Jack H. Trittipoe, Elwood, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1975, Ser. No. 566,463

Int. Cl.² E02F *3/76, 3/80*

U.S. Cl. 37—126 R **4 Claims**



1. A roller mounting providing independent axial and lateral adjustment of a roller, comprising:

a mounting bracket having a bore extending therethrough;

an elongated shaft extending into said bore of the mounting bracket and having opposite ends, a longitudinal axis, an eccentric portion formed on one of said ends having an axis radially offset from the longitudinal axis of the shaft, and a threaded portion formed on said other end of the shaft;

a roller rotatably mounted on the eccentric portion of the shaft so that rotation of the shaft within the bore of the mounting bracket causes limited lateral movement of the roller relative to the mounting bracket;

retaining means having a threaded bore extending therethrough screw threaded onto the threaded portion of the other end of the shaft so that rotation of the retaining means relative to the shaft and the mounting bracket causes the shaft to be selectively translated along its longitudinal axis for moving the roller axially relative to the mounting bracket; and

means for releasably locking the retaining means to the mounting bracket, said locking means being independent of contact with the shaft so that the shaft may be positioned at any one of a variety of axially spaced positions with respect to the retaining means and mounting bracket when the retaining means is locked to the mounting bracket, said locking means being of a construction sufficient for permitting the retaining means to be rotated relative to the mounting bracket and independently of the shaft for moving the shaft axially to said any one position.

4,011,671

PROGRESSIVE WEIGHT CHART

Danny L. Fogel, 160 N. Shores Drive, Solana Beach, Calif. 92075, and Leonard M. Luttbeg, 2828 Upshur St., San Diego, Calif. 92106

Filed Feb. 10, 1975, Ser. No. 548,826

Int. Cl.² G09B *29/00*

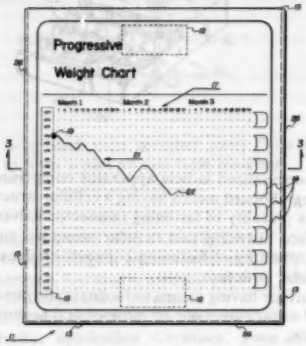
U.S. Cl. 35—7 R **1 Claim**

1. A progressive weight chart comprising:

a flat board member constituting the surface on which successive weight changes may be plotted, said member having a generally rectangular configuration;

a vertical weight scale disposed along one border of said member in proximity to the first edge thereof and forming one axis of said chart, successive numbers of said scale being grouped in groups of at least two numbers, each group being spaced from the next succeeding group by a greater vertical displacement than the vertical displacement between two adjacent numbers within each group;

a time scale disposed at right angles to said weight scale adjacent to another border of said chart and forming a second axis of said chart; and



a plurality of incentive indicia disposed along the border in proximity with that edge of said board member opposite to said first edge, each of said incentive indicia extending along a distinct weight range corresponding to one of said groups; said incentive indicia being correlated with said groups of numbers of said weight scale so as to reflect the progressive weight changes plotted on said chart and any psychological affect thereof.

4,011,672

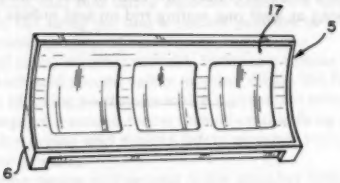
MOUNTING FRAME

Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 12, 1975, Ser. No. 631,291

Int. Cl.² G09F *3/18*

U.S. Cl. 40—16.2 **4 Claims**



1. A holder for photographs or the like comprising spaced end walls of a triangular-like configuration each having a long edge and a short edge, creating respectively an apex and a base at their intersection with the approximate hypothenuse, which hypothenuse is concave, a first side wall affixed to the apex of each end wall, a second side wall affixed to the base of each end wall, an undercut extending along the inner side of each of said first and second side walls, a third wall affixed to and extending between said end walls, and located between said first and second side walls, a flexible sheet of a size to fit snugly between said end walls and the first and second side walls, opposite edges of the sheet being positioned in each of said undercuts, said sheet being flexed inward in a concave configuration against said third wall, and the photographs or the like being positioned between and held in place by said sheet and said third wall whereby the holder may be placed in use in either of two positions: first residing on said long edge, or, second residing on said short edge.

4,011,673

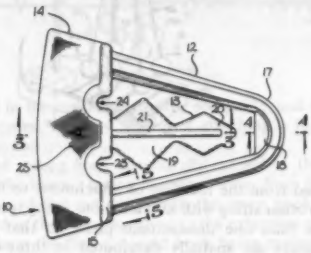
VISUAL INDICIA BEARING CLIP

Irving Levine, 23555 Park Belmonte, Calabassas Park, Calif. 91302

Filed Nov. 19, 1975, Ser. No. 633,253

Int. Cl.² G09F *3/16*

U.S. Cl. 40—23 A **7 Claims**



1. A visual indicia clip apparatus comprising:

a. a base member having visual indicia bearing means for receiving visual data, said base member including a pair of concave indentations disposed into the bottom surface thereof;

b. an outer clamping limb depending from the bottom surface of said base member and having a pair of outer arms, said outer arms being substantially V-shaped, said outer clamping limb being tapered from the junction between each of said arms and the bottom surface of said base member; and

c. an inner clamping arm depending from a ridge disposed along the bottom surface of the base member, said inner clamping arm being intermediate said concave indentations and centrally extending between the arms of said outer clamping limb, said inner clamping arm being in a planar relationship to said outer clamping limb, said inner clamping arm having first and second portions, said first portion being adjacent the bottom surface of said base member and extending laterally outwardly toward the outer arm of said outer clamping limb, the outermost lateral section of said first portion being tapered inwardly to a point adjacent said second portion, said second portion being tapered outwardly to a maximus which is less than the outermost lateral section of said first portion.

4,011,674

MAGNETIC KINETIC AMUSEMENT DEVICES

Sava W. Jacobson, 4915 Tyrone Ave., Sherman Oaks, Calif. 91403

Division of Ser. No. 492,042, July 26, 1974, Pat. No. 3,908,307. This application Sept. 25, 1975, Ser. No. 616,762

Int. Cl.² A63H *33/26*

U.S. Cl. 40—39 **3 Claims**

1. A magnetic kinetic amusement device comprising:

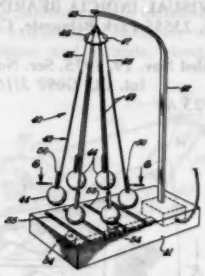
a frame,

at least three magnetic elements,

at least three mounting means supported by said frame, at least one magnetic element being mounted by each such means, said magnetic elements each having the same type of pole facing upwardly as each other magnetic element, said magnetic elements thus being supported in spaced, magnetically coupled relationship so that motion of one mounting means intermittently is interchanged magnetically with another such mounting means to produce inter-

mittent alternating motion of the magnetically coupled means, and

wherein each mounting means comprises a design member situated at the bottom of an individual string, a magnetic element being attached to each such design member, each string being attached to a location on said frame



spaced from the location of attachment to the frame of each other string with said locations being spaced apart in more than one dimensional plane so that said design members are spatially distributed in three-dimensional array,

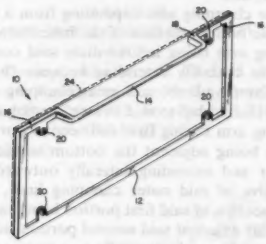
each string permitting both swinging and rotational motion of the attached design member.

4,011,675

REMOVABLE LICENSE PLATE HOLDER

Gerald L. Herring, Freeport, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 14, 1976, Ser. No. 648,866
Int. Cl.² G09F 7/00
U.S. Cl. 40—209 **4 Claims**



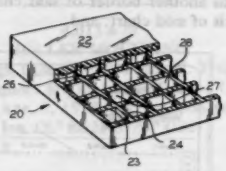
1. A vehicle license plate holder adapted to receive and be affixed to a license plate and as a unit engage therewith a vehicle bumper having first apertures therein comprising a substantially rectangular frame means, one side of said frame defining a first member out of planar alignment with the balance of said frame, said first member having inleted portions adjacent each distal end thereof, a shoulder communicating between each inleted portion and said first member, said inleted portions being in planar alignment with said frame, a plurality of second apertures defined on said frame means and being axially alignable with said first apertures, means for affixing said frame to said vehicle bumper through said first and second apertures, said means including an externally threaded bolt and an internally threaded nut adapted to engage said bolt and said plate, pivot means disposed on a distal end of said bolt, a second member integral with said pivot means and adapted to pivot about said pivot means between a position in planar alignment with said bolt and a position substantially perpendicular thereto, said second member adapted to engage said vehicle bumper through said first apertures.

4,011,676

PERSONALIZED MESSAGE SYSTEM AND PROCESS

Frederick J. Ritter, 6007 N. Sheridan Road, Chicago, Ill. 60660

Filed Jan. 8, 1975, Ser. No. 539,290
Int. Cl.² G09F 7/06
U.S. Cl. 40—143 **2 Claims**



1. A personalized indicia apparatus comprising:

an integral board means having a cellular structure comprising a plurality of fastening connector halves;

a surface covering said cellular structure and concealing said plurality of fastening connector halves forming said cellular structure,

said surface having means to facilitate the punching away of said surface over one or more of said fastening connector halves,

said means for facilitating the punching away of said surface comprising a series of geometrically shaped fragile peripheral indentations in said surface,

each of said series of said indentations aligned with one of said plurality of fastening connector halves respectively to enable facilitated removal of said surface in said geometric shape, directly over one of said plurality of fastening connector halves;

said indicia means including mating fastening connectors whereby the indicia may be inserted through the punched areas positioned in place in the cellular structure, and means whereby the connectors on the indicia attach themselves to the connector halves in the cellular structure;

said cellular structure comprising horizontal and vertical partitions beneath said surface between each of said series of geometrically shaped indentations, and

said connectors completing a seizure responsive to a snug fit between the cellular walls of said fastening connector halves and said connectors, each of said connectors comprising at least one mating rod on said indicia means.

4,011,677

FLOWER CORSAGE FRAME

Mary Kathryn Higdon, and Zalita Higdon Speas, both of 1324 E. Grand, Ponca City, Okla. 74601

Filed June 16, 1975, Ser. No. 586,989
Int. Cl.² A01G 5/00
U.S. Cl. 47—55 **8 Claims**

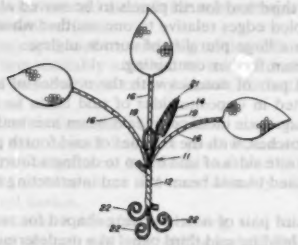
1. A leaf-stem assembly for use in floral arrangements consisting essentially of:

a. at least one leaf member, said leaf member consisting of at least two layers of material, said layers being sealed together;

b. at least one stem member, one end portion of said stem member being positioned between said layers for a distance of at least one-half the length of said leaf member; and

c. a wire member inserted through said leaf member at its

base portion and wrapped around the base portion of said leaf member and said stem member and thereafter extending along said stem member away from said leaf member to form a part of said stem member.



4,011,678

SAFETY SYSTEM FOR FIREARM

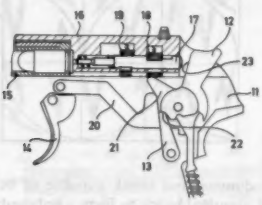
Eduard Brodbeck, Beringen, Switzerland, and Theobald Förster, Hohentengen, Germany, assignors to SIG Schweizerische Industrie-Gesellschaft, Germany

Filed May 20, 1976, Ser. No. 688,340

Claims priority, application Germany, June 27, 1975, 2528831

Int. Cl.² F41C *17/04*

U.S. Cl. 42—70 F **4 Claims**



1. A safety mechanism for firearms having a firing pin movable in a first direction to fire a cartridge and a first spring-loaded safety member movable in a second direction transverse to said first direction between a normal blocking position in which said first safety member engages a first recess formed on the firing pin and a release position in which the safety member is clear of said recess, comprising

a second safety member movable between a release position in which said second safety member clears the firing pin and a blocking position in which said second safety member engages a second recess formed on said firing pin, and

means for urging said second safety member towards said release position,

said urging means and second safety member being structured and located so that an impact which causes said first safety member to move to its release position also causes said second safety member to move to its blocking position to prevent an unintentional firing of the cartridge.

4,011,679

SPRING BIASED FISH HOOK SETTER

Melvin L. Smith, 12902 E. Sprague Ave., Spokane, Wash. 99216

Filed Jan. 10, 1974, Ser. No. 432,407

Int. Cl.² A01K *97/00*

U.S. Cl. 43—15 **1 Claim**

1. A spring biased fishhook setting device, comprising, in combination:

an extension type biasing spring defining an elongate central channel;

an elongate resilient first rod structurally joined to the first end of the biasing spring, having means for attachment of a fishing line at the end of joinder to the spring, extending through the central channel of the spring and a predetermined distance therebeyond to carry a substantially perpendicularly extending rod guide defining a central eye at a spaced distance from the first rod;

an elongate resilient second rod structurally joined to the second end of the biasing spring and extending in substantially axial alignment away therefrom in the same direction as the first rod, to pass through and be slideably

carried in the central eye of the rod guide, and to extend therebeyond to carry means of attaching a fishing line thereto; and

a J-shaped setting hook structurally carried by the second end of the biasing spring to extend away from the spring and toward the rod guide with the open hook element oriented in the same direction as the extension of the rod guide from the first rod, said hook being manually movable against both lineal and rotary spring bias to releasably hook into the central eye of the rod guide and be released therefrom by predetermined tension force between the two line fastening means.

4,011,680

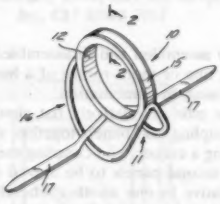
LINE GUIDE FOR A FISHING ROD

Donald D. Rienzo, Sr., Hicksville, N.Y., assignor to Allan Tackle Manufacturing Co., Inc., Hicksville, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,519

Int. Cl.² A01K *87/04*

U.S. Cl. 43—24 **7 Claims**



1. A line guide for a fishing line comprising:

a generally ring-shaped guide member made of a material consisting of titanium and ceramic as a binder, a matchingly shaped band of hard metal encompassing said guide member with a tight fit; and

mounting means fixedly secured to said metal band for fastening the guide member and the band to a fishing rod.

4,011,681

FISHING LURE

Manuel D. Johnson, 3284 Gwengreen, Bridgeton, Mo. 63044

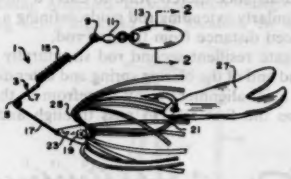
Filed Oct. 28, 1975, Ser. No. 626,351

Int. Cl.² A01K *85/00*

U.S. Cl. 43—42.11 **12 Claims**

1. A spinner bait comprising a wire harness having a forward apex portion to which a line or leader may be attached, a lower arm extending downwardly and rearwardly from the apex portion and terminating in a fish hook, and an upper arm extending upwardly and rearwardly from the apex portion and carrying at least one rotatable blade, characterized in that a substantial portion of said upper arm includes multiple bend

spring means for resiliently increasing the flexibility of said upper arm and for resiliently changing the length of said upper



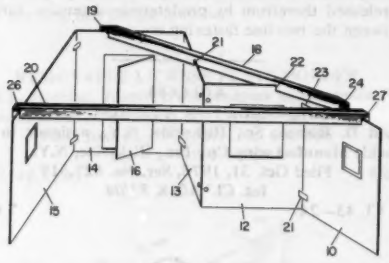
arm to give the entire bait a pulsating motion as it is drawn through the water.

4,011,682

TOY BACKDROP DISPLAY FOR SIMULATING ONE OR MORE ROOMS OF A DOLL HOUSE

Julie Ann Ach, Long Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 14, 1976, Ser. No. 649,759
Int. Cl.² A63H *3/52*
U.S. Cl. 46—21 **3 Claims**



1. An easily assembled and disassembled backdrop display for simulating one or more rooms of a house, such as a doll house, comprising, in combination:

at least one pair of relatively flat simulated wall panels, means coupling said panels together about edges thereof for forming a corner, said coupling means permitting said first and second panels to be moved about said coupled edges relative to one another whereby said panels may form a large plurality of corner angles;

a beam, said beam constructed of plastic material and having a U-shaped channel-like cross-section and a predetermined longitudinal axis;

said beam containing;

a first pair of notches, with the notches of said first pair located in opposite sides of said beam and defining a first passage axis therethrough at an angle to said beam axis;

a second pair of notches, with the notches of said second pair located in opposite sides of said beam for defining a second passage axis therethrough inclined to said beam axis and intersecting said first passage axis;

said second pair of notches being spaced a predetermined distance from said first pair of notches;

said first pair of notches being shaped for receiving therewithin and holding said first panel at a predetermined angle and position thereon and said second pair of notches being shaped for receiving therewithin and holding said second panel at a predetermined angle and position thereon;

whereby said beam holds said panels at a predetermined corner angle and increases the stability of said structure by adding weight to said panel edges at a location spaced from said corner and simulates a beamed ceiling; and

third and fourth simulated wall panels, means coupling said third and fourth panels together about edges thereof for forming a corner, said latter coupling means permitting said third and fourth panels to be moved about their said coupled edges relative to one another whereby they may form a large plurality of corner angles;

said beam further containing:

a third pair of notches with the notches of said third pair located in opposite sides of said beam to define a third passage axis inclined to said beam axis and a fourth pair of notches, with the notches of said fourth pair located in opposite sides of said beam to define a fourth passage axis inclined to said beam axis and intersecting said third axis, and

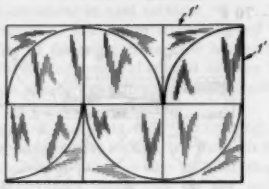
said third pair of notches being shaped for receiving within and holding said third panel at a predetermined angle and position thereon and said fourth pair of notches being shaped for receiving within and holding said fourth panel at a predetermined angle and position thereon.

4,011,683

SECTIONAL TOY BLOCK

Emilio José Jordão De Sousa, Rua do Salitre 171-3°, Lisboa, Portugal

Filed Aug. 21, 1975, Ser. No. 606,590
Claims priority, application Portugal, Feb. 21, 1975, 6433
Int. Cl.² A63H *33/08*
U.S. Cl. 46—25 **9 Claims**



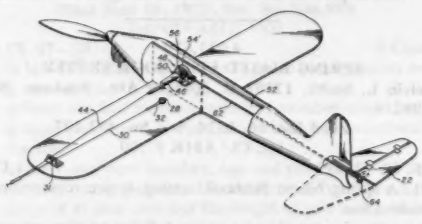
1. A three-dimensional block capable of being interfitted with a second identical block to form a polyhedron, said block comprising first and second integral juxtaposed portions of generally triangular shape having bases lying in a common plane, side faces lying in parallel planes, end faces superimposed on one another, and hypotenuse faces which are complementary in shape to one another and which are inclined in opposite directions and contained in planes which intersect one another whereby when the hypotenuse faces of a second block are placed on the hypotenuse faces of said one block the polyhedron is formed.

4,011,684

CONTROL MECHANISM FOR MODEL AIRCRAFT

Victor Stanzel, Schulenberg, Tex. 78956

Filed June 2, 1975, Ser. No. 582,590
Int. Cl.² A63H *27/04*
U.S. Cl. 46—77 **9 Claims**



1. In a self-supporting model aircraft of the type wherein

control of the aircraft about its lateral axis is accomplished by means of movement of a control surface on the aircraft, the improvement which comprises:

a control device on said aircraft for controlling movement of said control surface;

a control line capable of transmitting torsional force having one end non-rotatably attached to said aircraft and the other end attached to a control handle for rotating said control line; and

a flexible shaft means having one end non-rotatably attached to said control line at a point intermediate said control line's attachment to said aircraft and to said control handle and the other end non-rotatably attached to said control device,

whereby torsional forces for controlling said aircraft are transmitted through said control line and flexible shaft to said control device for controlling movement of said control surface.

4,011,685

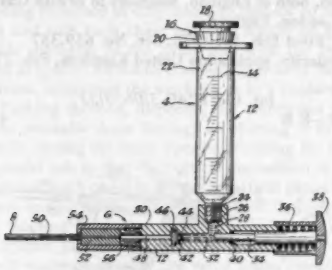
PLANT INJECTION METHOD AND APPARATUS

William A. Boyd, 430 N. Mashta Drive, Key Biscayne, Fla. 33149, and Richard T. Britt, 4580 NW. 79th Ave., Miami, Fla. 33166

Continuation of Ser. No. 482,268, June 24, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 642,780

Int. Cl.² A01G *29/00*

U.S. Cl. 47—57.5 **17 Claims**



1. A novel method of injecting plant material comprising:

injecting a needle into the plant material,

placing pressurized fluid through said needle into said plant,

the fluid under pressure initially being in an amount sufficient to create a force to seal the surrounding plant material and the outer wall of the needle together to seal the fluid under pressure placed into the plant material from escaping out of the plant material adjacent the outer wall of the needle,

subsequently providing additional fluid under pressure to place additional fluid into the plant material,

stopping additional fluid input through the needle into the plant material.

4,011,686

DOOR INTERLOCK SECURITY DEVICE

Edgar A. Jett, III, and Maurice L. Phillips, both of Richmond, Va., assignors to Carmine Foods, Inc., Richmond, Va.

Filed Aug. 4, 1975, Ser. No. 601,668

Int. Cl.² E06B *7/00*

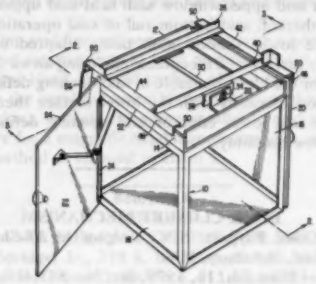
U.S. Cl. 49—68 **11 Claims**

1. A security device comprising:

a frame for defining a chamber;

first and second doors mounted to said frame adjacent openings into said chamber for movement between closed positions, in which they cover said openings, and open positions, in which they do not cover said openings; and

a rigid rocker arm having first and second opposite extremities located adjacent to edges of corresponding first and second doors, said rigid rocker arm being mounted to said frame for rocking movement between a first-door blocking position and a second-door blocking position, each of said first and second extremities of said rocker arm including a latch means for alternately occupying a blocking position blocking the movement of said correspond-



ing door from said closed to said open position and a non-blocking position allowing said corresponding door to move from said closed to said open position, said latch means moving between said blocking and unblocking positions when said rocker arm rocks, and for engaging an edge of said corresponding door when said corresponding door is in an open position to prevent the rocker arm from rocking.

4,011,687

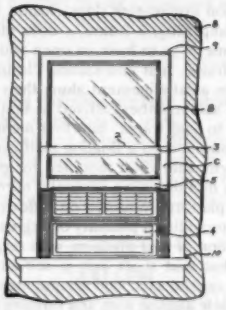
AIR CONDITIONER WINDOW SASH

Gary Siegle Disharoon, 1301 Earle Ave., Chesapeake, Va. 23324

Filed Nov. 25, 1975, Ser. No. 635,384

Int. Cl.² E06B *7/03*

U.S. Cl. 49—70 **1 Claim**



1. A double hung window assembly adapted to receive a receptacle enclosing an air conditioner unit or the like comprising:

a vertically movable upper window sash adapted to close substantially the upper half of the opening defined by said window assembly when situated at an uppermost position thereof, said upper window sash including a bottom rail positioned at substantially the vertical midpoint of said opening defined by said window assembly when situated at said uppermost position thereof; and

a vertically movable lower window sash adapted to close a portion of substantially the lower half of said opening defined by said window assembly, said lower window sash

including a top rail operationally positionable at the level of and operationally abutting said bottom rail of said upper window sash when said upper window sash is situated at said uppermost position thereof, said lower window sash further including a bottom rail operationally positioned a predetermined distance above the lower edge of said opening defined by said window assembly when said top rail thereof is operationally at the level of and abutting said bottom rail of said upper window sash when said upper window sash is at said uppermost position thereof, said bottom rail of said operationally positioned lower window sash being adapted to abut the upper surface of a receptacle enclosing an air conditioner unit or the like mountable in said opening defined by said window assembly with the lower surface thereof resting upon said lower edge of said opening defined by said window assembly.

4,011,688

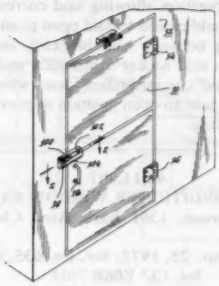
DOOR CLOSURE MECHANISM

Charles Geiss, Bayport, N.Y., assignor to All-Shield Enclosures, Inc., Westbury, N.Y.

Filed Jan. 16, 1975, Ser. No. 541,418

Int. Cl.² E05F *11/34*

U.S. Cl. 49—139 **8 Claims**



1. In a radiation attenuating door closure mechanism, the improvement comprising, a frame, a door mounted with respect to said frame so as to have an open and closed position relative to said frame, first and second closure members designed to close in axial alignment along their respective central axes, one of said members affixed to said door, the other of said member to said frame, said first member including a threaded shaft mounted on a floating platform and extending from said platform, said shaft mounted for positioning of its longitudinal axis in a direction generally normal to said door and frame, said platform mounted on a flexible support, said flexible support providing a plurality of degrees of freedom for varying the position of said platform with respect to said first member such that said shaft axis is self-aligning with said second member central axis, said second member including a threaded receptacle aligned with and forming said central axis of said second member for receiving said threaded shaft, and means for rotating said threaded shaft into said threaded receptacle, thereby drawing and securing said door to said frame.

4,011,689

GRINDING MACHINE

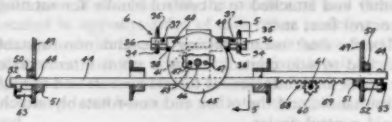
Artemio S. Cozzini, 3464 N. Dousman, Milwaukee, Wis. 53212

Filed Sept. 5, 1975, Ser. No. 610,845

Int. Cl.² B24B *53/04*

U.S. Cl. 51—5 D **15 Claims**

1. A grinding machine, comprising a supporting structure, a pair of grinding wheels mounted for rotation with respect to the supporting structure, each grinding wheel having a generally cylindrical surface and an outer beveled surface disposed at an angle of less than 45° with respect to said cylindrical surface, said beveled surfaces disposed in mating relation to grind a blade inserted therebetween, dressing means including a separate dressing element for each grinding wheel for dressing the beveled surface of the respective grinding wheels,



support means to carry the dressing means, and mounting means for mounting the support means for movement in a non-linear path with respect to the supporting structure such that each dressing element will move across the respective beveled surface to dress the same during movement of said support means.

4,011,690

PIPE CLEANING APPARATUS

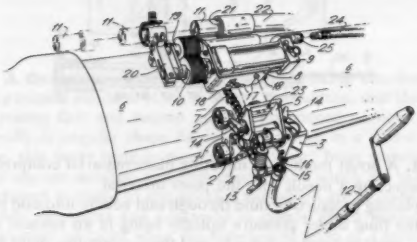
John Colin Braithwaite, Newcastle, and John Lawton Edwards, Ashington, both of England, assignors to British Gas Corporation, London, England

Filed Feb. 19, 1976, Ser. No. 659,357

Claims priority, application United Kingdom, Feb. 27, 1975, 8291/75

Int. Cl.² B24C *3/06, 3/32*

U.S. Cl. 51—8 R **4 Claims**



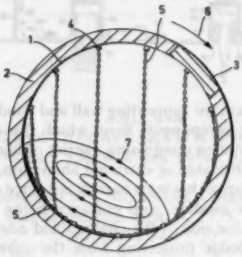
1. An apparatus for cleaning a surface of a pipe by grit blasting which comprises a carriage provided with a driving mechanism, a tensioning device and a fixing plate, the carriage being movably attached to the pipe by a chain which passes around the pipe and over part of a rotatable toothed cog, which cog is the final drive of the drive mechanism, and attached to the fixing plate is a body provided with an air motor which comprises means for operating a piston in a longitudinal direction along the pipe, and fixed to the piston is a grit blasting nozzle, wherein, in use, the apparatus travels around the pipe by rotating the final drive cog from the drive mechanism, whilst the nozzle reciprocates over a set longitudinal area of the pipe.

4. A method of cleaning a surface of a pipe by grit blasting using the apparatus according to claim 1, comprising the following steps, attaching the carriage to a pipe by means of a chain and tensioning the carriage by means of the tensioning device, attaching the body, including the air motor piston and grit nozzle, to the fixing plate on the carriage, applying the necessary compressed air power to the motor and grit to the nozzle, fixing the hand operated drive to the drive mechanism and rotating the apparatus around the pipe with a piston reciprocating over a set longitudinal area of the pipe.

4,011,691
METHOD AND DEVICE FOR REMOVAL OF FINS FROM WORKPIECES

Peter Grund, Lutzelsachsen, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 440,334, Feb. 7, 1974, abandoned. This application July 9, 1975, Ser. No. 594,299
Claims priority, application Germany, Mar. 24, 1973, 2314821
Int. Cl.² B24B *1/00*
U.S. Cl. 51—314 **8 Claims**

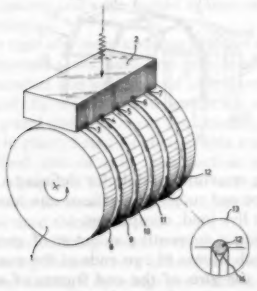


1. A method of removing flashing, fins and the like from molded workpieces comprising the steps of detachably mounting chains to the inner wall of a rotatable drum with each chain being mounted at only one end thereof so as to be free hanging and with each chain having a length no greater than the inside diameter of the drum and with the chains being mounted at spaced locations completely around the inner wall of the drum, subjecting the workpieces to a coolant to embrittle the flashing thereon, disposing the embrittled workpieces inside the rotatable drum through an opening in its circumferential wall, closing the drum opening, rotating the drum about its horizontal axis so that the vertical disposition of each chain is changed as each chain moves in a vertical plane around the drum axis, impacting the chains against the flashing for removing the flashing from the workpieces by the action of the chains against the embrittled flashing, and withdrawing the deflashed workpieces from the same drum opening through which they were inserted.

4,011,692
METHOD OF AND DEVICE FOR GRINDING GROOVES

Jules Bos, and Günter Von Der Kall, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,437
Claims priority, application Netherlands, July 5, 1974, 7409107
Int. Cl.² B26B *1/00*; H01F *7/00*
U.S. Cl. 51—323 **4 Claims**



1. A method of manufacturing the core for a magnetic head comprising the following steps:

providing a first block of ferrite;

providing a number of mutually parallel grooves in a surface of said first block of ferrite said grooves being ground by pressing said first block against a rotating drum having a circumferential groove and at least one metal wire disposed in said groove with at least a part of the cross section of said wire projecting above the surface of said drum;

providing a second block of ferrite; positioning said surface of said first block against a surface of said second block of ferrite

connecting said first and second blocks with a non-magnetic material intermediate at least portion of said surface of said first block and said surface of said second block;

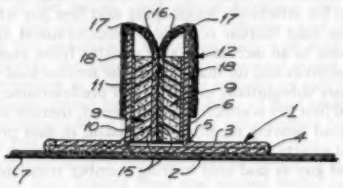
severing the resulting assembly into individual head cores by making sawcuts extending parallel to said grooves.

2. A core for a magnetic head manufactured in accordance with the method as claimed in claim 1.

4,011,693
CLEANER FOR CAUTERIZING IMPLEMENTS

John D. Eldridge, Jr., 310 S. Bayfront, Balboa Island, Calif. 92662, and William D. DeMayo, 511 Hazel Drive, Corona Del Mar, Calif. 92625

Continuation-in-part of Ser. No. 567,627, April 14, 1975, Pat. No. 3,982,357. This application Feb. 9, 1976, Ser. No. 656,417
Int. Cl.² B24D *15/08*
U.S. Cl. 51—354 **4 Claims**



1. A cleaner for cauterizing implements, comprising:

a. a mounting member having a mounting surface and a pair of upstanding webs flexibly connected to the mounting member;

b. a pair of flat magnet units secured to confronting sides of the webs;

c. and a covering including abrasive material over the confronting sides of the magnet units;

d. the magnets exerting a mutually attractive force yieldably maintaining the abrasive coverings in mutual contact; said force diminishing on separation of the abrasive coverings upon insertion of a surgical implement therebetween.

4,011,694
METHOD AND APPARATUS FOR GUYING A LOAD BEARING MEMBER

Frederic E. Langford, Redmond, Wash., assignor to Formac International Inc., Seattle, Wash.

Filed Nov. 28, 1975, Ser. No. 635,908
Int. Cl.² E04H *12/20*
U.S. Cl. 52—1 **20 Claims**

1. In an apparatus for guying a load bearing member capable of having a variable force exerted thereon in a predetermined direction including

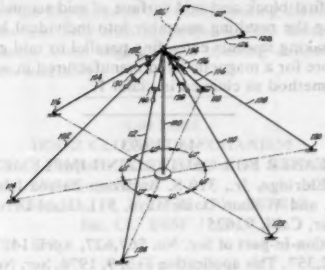
a first guy and means for attaching said first guy to said load bearing member and to an anchor so as to place said first guy under a predeterminable tension load when said variable force is exerted on said member,

a second guy and means for attaching said second guy to said member and to a second anchor so as to place said

second guy under a predeterminable tension load when said variable force is exerted on said member, said second guy being oriented relative to said predetermined direction so that the predeterminable tension load in said first guy is greater than the predeterminable tension load in said second guy,

an improvement for transferring a portion of the load being borne by said first guy to said second guy when said variable force is exerted on said member, comprising:

extensible means serially interconnected with said first guy between said member and said anchor so that the tension



load placed on said first guy is transferred along a load path from said load bearing member through said guy and said extensible means to said anchor, said extensible means for effectively lengthening said first guy when the tension load therein reaches a predetermined value in response to an increase in said variable force exerted on said member and for maintaining the tension load on said first guy substantially equal to said predetermined value as said first guy is effectively lengthened, thereby allowing said load bearing member to translate in said predetermined direction to increase the load being borne by said second guy as said load bearing member translates.

4,011,695

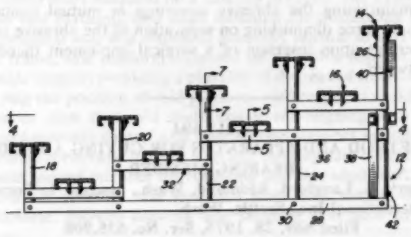
BLEACHER SYSTEM

William B. Simmons, Sr., Geneva, Ala., assignor to William M. Russell, Jr. and Mary L. Russell, both of Geneva, Ala.

Filed Oct. 7, 1975, Ser. No. 620,363

Int. Cl.² E04H *3/12*; E04C *3/02*

U.S. Cl. 52—8 **15 Claims**



1. In a bleacher structure having adjacent tubular posts interconnected by supports and channel shaped members connected to the supports between the posts, each of said channel-shaped members having parallel spaced supporting flanges resting on associated supports, a load supporting web interconnecting the supporting flanges, and spaced reinforcing flanges intermediate the supporting flanges depending from the web below the supporting flanges, and fastener means for securing the reinforcing flanges to the associated supports.

4,011,696

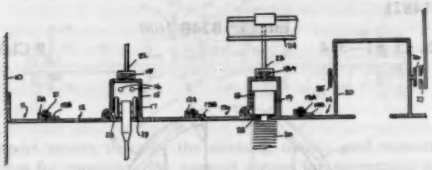
MULTIPLE-LINE SOFFIT SYSTEM

Carlton Klein, New York, N.Y., assignor to New York Flameproofing Company, Inc., New York, N.Y.

Filed July 17, 1973, Ser. No. 380,069

Int. Cl.² B09F *7/19*

U.S. Cl. 52—39 **4 Claims**



1. A soffit system for supporting wall and window coverings having hardware components from which the coverings are suspended, said system comprising a series of like interlocking track modules fabricated of extruded aluminum, each including a recessed channel having a narrow entrance extending the full length of the module, said entrance being defined by a gate pivoted on one side of the channel and adapted to swing inwardly and a ledge projecting from the other side of the channel and spaced from the gate to form said narrow entrance, said module having a recess formed at the junction of the channel and the module wall to define an arcuate socket extending the full length of the module, said gate being formed of a plastic material having a relatively low coefficient of friction and having a bead at one edge extending the full length thereof which is received in said socket to create a hinge requiring no pin, said gate being liftable to admit the hardware components of a particular covering into said channel whereby when said gate is thereafter closed, it entraps the components, each module having at its ends complementary joining elements whereby adjoining elements may be interlocked to provide as many channels as is required by the window and wall coverings, said module channel having integral therewith at its top a coupling head with a T-formation which extends the full length of the module whereby said module may be supported from an overhead structure by means of hangers having a complementary formation.

4,011,697

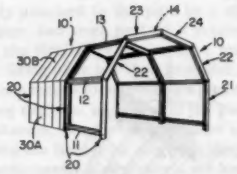
BUILDING CONSTRUCTION

James L. Fedolfi, Concord, N.H., assignor to Luke J. Roddy, West Roxbury, Mass.

Filed Dec. 8, 1975, Ser. No. 638,549

Int. Cl.² E04B *1/32*

U.S. Cl. 52—90 **5 Claims**



1. A building structure module for defining a roofed-over, walled enclosure and supporting at least one hundred pounds per square foot live load, comprising,

means defining a supporting skeleton of girts arrayed as gambrel arch frames at two ends of the module,

and wherein the girts of the end frames of each gambrel arch are secured end to end and comprise overlapping girt end faces with a higher one resting on a lower one at each angle bend of the gambrel arch to distribute roof loading, and further comprising,

means defining horizontal purlins interconnecting the frames,

the girts and purlins being arranged in a truss-free gambrel arch and overlaid with essentially end-to-end arrayed panels of at least 50,000 psi yield strength, along the side wall, mid roof and top roof sections of the gambrel arch.

4,011,698

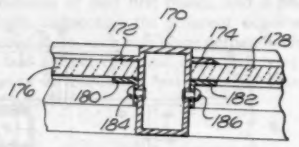
CONSTRUCTION APPARATUS AND METHOD

Richard L. Sklaar, 320 S. Clark Drive, Los Angeles, Calif. 90048

Continuation of Ser. No. 450,011, March 11, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,470

Int. Cl.² E04B 5/52

U.S. Cl. 52—98 **2 Claims**



1. A structure comprising:

a plurality of elongated construction members each including a body having a longitudinal surface and an outwardly extending longitudinal rib formed integrally with said body and disposed perpendicular to said surface, said rib having sufficient structural strength to support a panel member thereagainst without failure of said rib throughout the load range normally applied to said panel;

at least one of said elongated construction members further including an additional rib extending outwardly therefrom and displaced 180° from said longitudinal rib, said additional rib being load bearing and having a reduced thickness immediately adjacent said body and having sufficient structural strength to support said panel under normal load ranges, a portion of said first surface of said panel along another edge thereof seated against said additional rib;

a panel member having one edge seated on said longitudinal surface of said body and a portion of a first surface of said panel adjacent said edge seated against said rib in bearing relationship;

right angle rigid clip means having first and second orthogonally disposed arms, said first arm bearing against said panel member and said second arm bearing against said body, said clip means seated against the opposite surface of said panel member, said clip means, prior to being secured in place, being freely movable transversely of the longitudinal axis of said construction member to any position along said longitudinal surface of said construction member for seating securely against a panel member of any desired thickness; and

securing means affixing said clip means rigidly to said body, said securing means being affixed to said body and said clip means through openings provided in said body only after said panel member is seated against said rib and said clip means is seated against said panel and said construction member surface, thereby to secure said panel member in place.

4,011,699

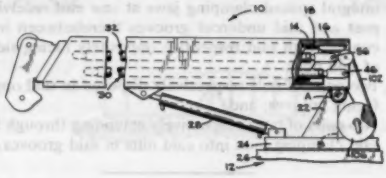
TELESCOPIC BOOM QUICK RETRACT HYDRAULIC CIRCUIT

Roger D. Mickelson, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 27, 1975, Ser. No. 608,111

Int. Cl.² E04H 12/34; F15B 7/00

U.S. Cl. 52—115 **7 Claims**



1. In a crane having a boom with telescopic sections including a base boom section, a mid boom section, and a tip boom section, a first hydraulic motor connected between the base boom section and the mid boom section for extension and retraction of the mid boom section with respect to the base boom section, and a second hydraulic motor connected between the mid boom section and the tip boom section for extension and retraction of the tip boom section with respect to the mid boom section, each of said motors comprising a cylinder with a piston slidable therein to define an extend chamber and a retract chamber on opposite sides, respectively, of the piston, each piston having a rod connected thereto and extending from the cylinder, said piston rods having two passages in communication with said chambers, respectively, the piston rod of said second motor connected for movement in unison with the cylinder of said first motor, a hydraulic circuit including a source of fluid under pressure and including a valve having a first valve portion between said source and said first motor and having a second valve portion between said source and said second motor, a reel to hold hydraulic lines leading from said second motor rod, the improvement comprising a retract hydraulic line connecting the retract chambers of said motors to pass fluid between said second valve portion and said retract chamber of the second motor through the retract chamber of said first motor, and an extend hydraulic line connecting said extend chamber of said second motor to said valve over the reel.

4,011,700

ADJUSTABLE-HEIGHT POST ASSEMBLY FOR READY INSTALLATION ON A WINDOW FRAME OR THE LIKE

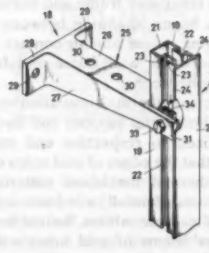
Yukio Sado, Asahi, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Toyko, Japan

Filed Nov. 20, 1975, Ser. No. 633,957

Claims priority, application Japan, Nov. 27, 1974, 49-144528

Int. Cl.² E04H 1/00

U.S. Cl. 52—235 **3 Claims**



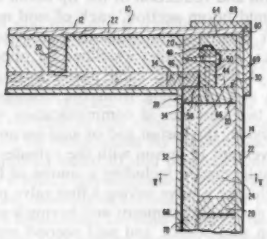
1. An assembly comprising in combination:

a. a post of uniform cross-sectional shape throughout its length, said post including a pair of oppositely facing side walls, therebeing a pair of oppositely opening undercut grooves extending longitudinally along the length of said side walls respectively;
b. a pair of brackets spaced along the length of said post, each bracket comprising (1) means for mounting the same on a desired stationary surface, and (2) a pair of integral spaced clamping jaws at one end receiving said post and said undercut grooves therebetween in direct contact with said respective oppositely facing side walls of said post;
c. two pairs of nuts respectively disposed in said oppositely facing grooves; and
d. two pairs of bolts respectively extending through holes in said clamping jaws into said nuts in said grooves.

4,011,701
MODULAR HOME WALL CONSTRUCTION CORNER JOINT

Kalevi Matti Turkia, Williamsport, Pa., assignor to Capital Housing, Inc., Avis, Pa.

Filed Mar. 29, 1976, Ser. No. 671,856
Int. Cl.² E04B *1/00;* **E04C** *1/10*
U.S. Cl. 52—275 **3 Claims**

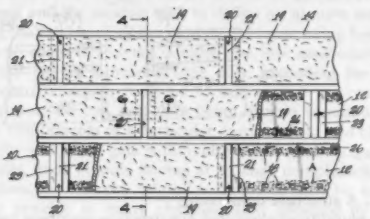


1. An improved modular home wall construction corner joint, said corner joint being formed of first and second, end joined wall assemblies, each wall assembly comprising:
inner and outer walls,
edge abutting inner and outer wall frames,
said outer wall frame comprising:
horizontally spaced, vertical studs,
a lower horizontal base beam underlying the lower ends of said studs and being fixed thereto,
an upper cross beam spanning the upper ends of said vertical studs, being fixed thereto and forming with said vertical studs and said base beam a series of parallel vertical cavities,
vertical strips of thermal insulation material positioned within said vertical cavities and having at least the ends thereof fixed to said cross beam and said base beam,
said inner wall frame overlying and being fixed to said inner wall frame and comprising vertical studs at respective ends of said inner wall frame and vertically spaced, horizontal cross beams spanning between said vertical end studs and lying across and in contact with said vertical studs of said outer wall frame and forming horizontal cavities therebetween,
horizontal strips of thermal insulation material positioned within said horizontal cavities and having their ends respectively fixed to respective end studs of said outer frame such that the edges of said strips of said vertical and horizontal thermal insulation material strips intersect each other to substantially eliminate cold spots within the walls of said wall assemblies, limited to crossover contact of said cross beams of said inner wall frame and said vertical studs of said outer wall frame,
the end studs of at least one wall frame of each wall assembly being longitudinally offset relative to the end studs of the other wall frame to form an interfitting step for receiving the ends of an abutting wall assembly,
means for nesting the end studs of respective wall assemblies together at right angles to each other at said step,
an air infiltration barrier strip interposed between the abutting end studs of respective assemblies at said step to form an effective water tight corner joint,
said outer walls extending beyond the end studs of respective wall assemblies and abutting each other to form a vertical corner cavity with said end studs of respective wall assemblies, and thermal insulation material strips overlying respective faces of said end studs within said cavity to reduce heat loss through said corner joint.

4,011,702
BUILDING WALL CONSTRUCTIONS

Andrew M. Matyas, 1642 North Road SE., Warren, Ohio 44484

Filed Apr. 18, 1975, Ser. No. 569,371
Int. Cl.² E04C *5/18;* **E04F** *13/08*
U.S. Cl. 52—387 **4 Claims**



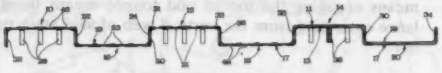
1. A building construction for fabricating a veneer facing wall, comprising:
a flat panel formed of thin, rigid material, said panel having pairs of spaced parallel ridges co-extensive with the longitudinal length thereof and forming a flat-bottomed trough between each pair, each ridge being U-shaped in cross-section to form a bight and legs extending at right angles from said bight and integrally joined at right angles with an adjoining trough portion,
a plurality of veneer building blocks, each formed as a rectangular slab of a predetermined length and of a width to fit flatwise within a trough and closely but freely and without interference fit between bight legs of adjacent ridges, said blocks being of a thickness at least equal to the depth of a trough so that outer faces of said blocks are exposed, and with the bights of said ridges exposed between said blocks,
the bottom of each trough having a series of lanced-out portions along a line but inward of each ridge, each lanced-out portion providing a lip displaced from the inner surface of said trough and projecting from an outer surface of the same, and each lip being aligned with the opening formed in the Lancing operation,
adhesive material between the inner face of each of said blocks and the inner surface of a said trough for holding said building blocks in place,
said adhesive material being applied in layer form along the line of and over said lanced-out portions to interlock with the same, and
said building blocks being assembled with said panel by pressing individual blocks into a said trough and against said adhesive to urge some of the latter through the openings formed by the lanced-out portions, said displaced lips providing a stop for said adhesive material to restrain it from falling from the outer surface of said trough.

4,011,703

BUILDING ELEMENT FOR MAKING INSULATING PANELS AND PANELS ASSEMBLED THEREFROM

Umberto Tanzilli, Via Ippolito Nievo 1, Sora, Frosinone, Italy

Filed June 25, 1975, Ser. No. 590,263
Claims priority, application Italy, June 27, 1974, 12205/74
Int. Cl.² E04C 2/42
U.S. Cl. 52—618 6 Claims



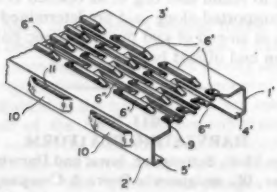
1. A plastic building element comprising a plurality of identical first substantially square plates arranged in spaced relationship in a first coplanar rectilinear row, the spacing between successive first plates being equal to the longitudinal dimension of said first plates; a plurality of identical second rectangular plates arranged in spaced relationship in a second coplanar rectilinear row spaced from, parallel to, and aligned with said first row, the longitudinal dimension of said second plates and the spacing between successive second plates being equal to the longitudinal dimension of said first plates, and the transverse dimension of said second plates being less than the transverse dimension of said first plates; and a plurality of webs respectively connecting the adjacent edges of a first plate and a second plate, each web being perpendicular to said first row and said second row, and each web lying entirely within the edge of its associated first plate and externally of the edge of its associated second plate.

4,011,704

NON-GHOSTING BUILDING CONSTRUCTION

Theodore S. O'Konski, Wheeling, W. Va., assignor to Wheeling-Pittsburgh Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 175,967, Aug. 30, 1971, abandoned. This application Nov. 1, 1972, Ser. No. 302,830
Int. Cl.² E04C 3/09, 3/32
U.S. Cl. 52—735 5 Claims



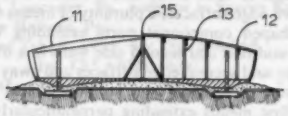
1. A metal structural channel member formed of a single thickness of sheet metal and having a side panel and two end panels at opposite ends of the side panel, said side panel having a plurality of closely spaced parallel rows of areas each severed therefrom along two coextensive parallel slits and stretched laterally from the plane of the side panel to a plane parallel to the original plane of the side panel, said areas being characterized by an absence of slits between the parallel slits, the areas in adjacent rows being staggered with respect to each other and displaced to opposite sides of the original plane of the side panel to provide a multiplicity of different tortuous paths through the side panel of the channel member for lengthening the thermal conduction path from end panel to end panel to inhibit heat conduction therethrough from end panel to end panel and for enhancing heat radiation therefrom.

4,011,705

METHOD FOR CONSTRUCTING A THIN-SHELL CONCRETE STRUCTURE DESIGNED FOR LIFTING WITH HYDRAULIC APPARATUS

Peter Martin Vanderklaauw, 1450 Madruga Ave., Coral Gables, Fla. 33146

Filed Oct. 31, 1975, Ser. No. 627,835
Int. Cl.² E04B 1/00; E04H 1/00
U.S. Cl. 52—745 8 Claims



1. A method of constructing a thin-shell concrete structure comprising the steps:

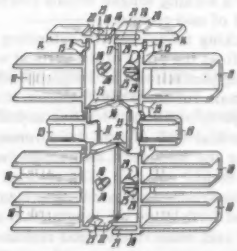
a. preparing foundation pads at spaced zones about the perimeter of the structure to be erected;
b forming a circular base for a concrete floor of sand, gravel or soil in the area bound by the foundation pads;
c. shaping the surface of the circular base by revolving a screed about a point at the center of the circular base;
d. placing vertical columns on each foundation pad;
e. placing reinforcing steel on the screed circular base;
f. pouring a concrete floor on the base including about the vertical columns;
g. forming an insulating liner having circular side walls and a dome-shaped top;
h. temporarily supporting the liner top from the concrete floor;
i. forming a concrete coating on the external surface of the side walls of the insulating liner;
j. forming a concrete coating on the external surface of the dome-shaped insulating liner; and
k. removing the temporary supports for the liner top after the concrete is cured.

4,011,706

CORNER CONNECTOR FOR BOARD SHAPED COMPONENT PARTS

Hans-Werner Düpree, 154, Osnabrucker Landstrasse, 11 Gutersloh, 483, Germany

Filed May 30, 1975, Ser. No. 582,294
Claims priority, application Germany, June 1, 1974, 2426723
Int. Cl.² F16B 2/20
U.S. Cl. 403—231 9 Claims



1. A corner connector for board shaped component parts comprising: a hinge member of a continuous sheet of plastic material having a first half and a second half formed and connected to pivot about a hinge line, each of said first and second halves having a flat outer surface, a flat inner surface parallel with said flat outer surface, a first edge surface defining part of said hinge line, and a second edge surface spaced

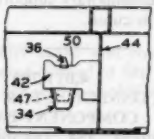
from said first edge surface a distance equal to the width of said flat outer and inner surfaces, a first side wall extending transversely to said flat inner surface of said first half at said second edge surface, said first side wall being formed integrally with said second edge surface of said first half, a second side wall extending transversely to said flat inner surface of said second half at said second edge surface, said second side wall being formed integrally with said second edge surface of said second half, said first and second side walls both extending parallel to each other and a similar distance from their respective edge surfaces, a plurality of means for engaging the board shaped component parts extending outwardly from each of said first and second side walls in a direction perpendicular to said second edge surfaces and away from said hinge line formed by said first edge surfaces of said first and second halves, first means extending perpendicularly from said flat inner surfaces of said first half away from said flat outer surface for interengaging with similar means on said flat inner surface of said second half, and second means extending perpendicularly from said flat inner surface of said second half away from said flat outer surface similar to said means on said flat inner surface of said first half for interengaging therewith, whereby when said first and second halves are pivoted about said hinge line said means for interengaging on said flat inner surfaces of said first and second halves are locked together to thereby form the corner connector.

4,011,707

CROSS TEE END JOINT FOR SUSPENDED CEILING SYSTEM

Ernest B. Nute, Jr., Mountville, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed July 2, 1975, Ser. No. 592,557
Int. Cl.² F16B *7/22*
U.S. Cl. 52—664 **2 Claims**



1. A suspended ceiling grid structure adapted to support ceiling panels and the like, comprising:

a. a main runner having a vertical web and oppositely disposed flanges,

b. a cross tee having a vertical web and oppositely disposed flanges, a locking tongue means extending from at least one end of said cross tee,

c. said locking tongue means extending generally perpendicular from the plane of the vertical web of the cross tee and being parallel with and adjacent with the vertical web of the main runner when the cross tee and main runner are properly positioned relative to each other,

d. said vertical web of said main runner having a means engaging the bottom of said tongue means to hold said tongue means adjacent said vertical web of said main runner and restraining said tongue means from movement back and forth along the longitudinal axis of said vertical web of said main runner and restraining said cross tee fixedly in position relative said main runner, said means engaging the bottom of said tongue means is a bracket means engaging the bottom of said tongue means and said bracket means extends from the vertical web of the main runner structure and has an extension which extends parallel with the plane of said tongue means to hold said tongue means adjacent said vertical web of said main runner and to hold said cross tee and main runner in a fixed position, said tongue means has a notch forming shoulders on the bottom edge thereof which engage the sides of the bracket means to restrain the tongue means from movement along the longitudinal axis of said vertical web of said main runner, and

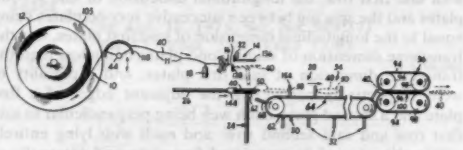
e. said vertical web of said main runner further having a means which engages the top of said tongue means to restrain said tongue means from movement upward to prevent said tongue means from disengagement from said means engaging the bottom of said tongue means, said means engaging the top of said tongue means being a lance extending from the vertical web of said main runner.

4,011,708

BAG HANDLING APPARATUS

Fred P. Brown, Jr., Centerville, Mass., assignor to Packaging Industries, Inc., Hyannis, Mass.

Filed Nov. 26, 1974, Ser. No. 527,360
Int. Cl.² B65B *5/00, 43/26*
U.S. Cl. 53—187 **4 Claims**



1. Bag handling apparatus comprising:

means for severing individual bags from a continuous web of bags;

carrier means engaging each bag severed from said web and transporting it along a predetermined path with an open end of each of said bags disposed for insertion of an article, said carrier means including pairs of spaced lugs for retaining respective ones of said severed bags while transporting them along said predetermined path;

means for conveying each bag severed from said web to said carrier means, said conveying means having means for pushing against one edge of a severed bag to bring the opposite edge of said bag to bear against the first lug of a pair of said lugs on said carrier means for opening said end of said severed bag, the other of said pair of lugs thereafter being brought to bear against said one edge of said bag to retain said bag in its opened condition while being transported along said predetermined path;

and means at an end of said predetermined path for sealing said open end of said bags.

4,011,709

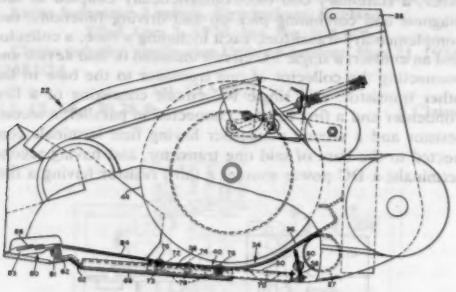
HARVESTING PLATFORM

Roger Eugene Mott, Bettendorf, Iowa, and Darwin Carl Bichel, East Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Nov. 13, 1974, Ser. No. 523,507
Int. Cl.² A01D *69/00*
U.S. Cl. 56—10.4 **4 Claims**

1. A harvesting platform for mobile harvesting machine comprising: a transversely elongated platform frame havng opposite sides; a platform floor extending between the opposite sides; a transverse crop conveyor means mounted on the frame above the floor for moving the crop laterally on the platform; a transverse cutter bar extending between the opposite sides of the platform frame forwardly of the floor; a drive means for driving the cutter bar and including a drive mechanism mounted on one end of the cutter bar and having a rotary input element and a reciprocating output element connected to the cutter bar; and means mounting the cutter bar on the platform frame for selective tilting adjustment about a transverse horizontal axis to vary the tilt of the cutter bar relative to the ground, the drive mechanism on the end cutter bar tilting with the cutter bar; a belt drive on one side of the

platform, drivingly connected to the drive mechanism and including a belt tensioning means operative to supply belt



tension regardless of the tilt position of the cutter bar and the drive mechanism mounted thereon.

4,011,710
BALER WITH DOUBLE-ACTING PLUNGER

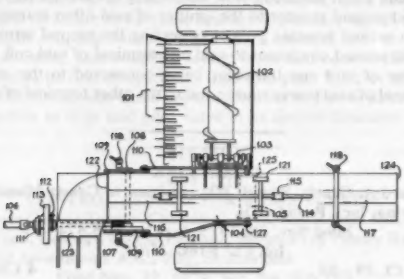
Helwig Schmitt, Raiffeisenstrasse 5, 3523 Grebenstein near Kassel, Germany

Filed Oct. 23, 1974, Ser. No. 517,129

Claims priority, application Germany, Oct. 25, 1973, 2353381

Int. Cl.² B30B *1/06, 9/38*

U.S. Cl. 56—341 **1 Claim**



1. A hay baler comprising a mobile frame, a hay pickup mounted on one side of the mobile frame, a pair of generally fore and aft extending bale chambers having common generally straight top, bottom and side walls, mounted on the side of the frame adjacent to the hay pickup, a hay inlet aperture in one side wall of the bale chambers substantially mid-way between the ends of the wall, feed means to feed hay from the hay pickup through the hay inlet aperture, a plunger moveably supported in the bale chambers, plunger guide means mounted on the top and bottom walls for guiding the plunger in a generally fore and aft straight line, drive means for reciprocating the plunger back and forth so that it alternately moves hay to the rear and compresses it in one of the bale chambers and then moves hay to the front and compresses it in the second bale chamber, said drive means including a shaft rotatably mounted adjacent to the bottom wall of the bale chambers, drive means to rotate the shaft, a crank member mounted on the shaft adjacent to each side wall, the forward bale chamber having a connecting rod connected to each of the crank members and a trunion projecting from each side of the plunger and the adjacent side wall of the bale chambers, the connecting rod on the side of the bale chambers adjacent to the hay pickup including a generally horizontal portion and a generally vertical portion which leave the hay inlet aperture in one side wall of the bale chamber unobstructed when the plunger moves into the rear bale chamber, and drive means to drive said feed means to feed hay from the hay pickup through the hay inlet aperture each time the plunger moves into the rear bale chamber and each time the plunger moves into the forward bale chamber.

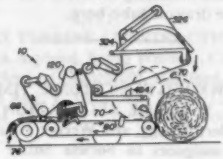
4,011,711
BALE ACTUATED CONTROL FOR THE REAR ROLL FORMING CHAMBER IN A CROP MATERIAL ROLL FORMING MACHINE

Aquila D. Mast, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Feb. 9, 1976, Ser. No. 656,760

Int. Cl.² A01D *39/00*

U.S. Cl. 56—341 **13 Claims**



1. In a crop material roll forming machine, the combination comprising:

a mobile frame adapted to move across a field;

means on said frame for delivering crop material to said machine;

a rear roll forming chamber on said frame including means for forming a roll of crop material therein and operable to discharge said roll therefrom;

a front roll forming chamber on said frame including means for initiating formation of another roll therein;

means on said frame for causing transfer of said another roll to said rear chamber after said roll in said rear chamber has been discharged;

mechanism on said frame operable for adjusting an inlet opening to said rear chamber between a first size adapted to allow the delivery therethrough of crop material for forming of a roll in said rear chamber and a second size larger than said first size and adapted to allow the transfer therethrough of said another roll from said front chamber into said rear chamber; and

means on said frame for controlling the operation of said inlet opening adjusting mechanism, said controlling means including a member positioned for actuation by said another roll when the same is transferred into said rear chamber such that upon actuation of said member by said another roll, said controlling means causes operation of said mechanism to adjust said inlet opening of said rear chamber from its second to its first size.

4,011,712
THREAD DRAWOFF TUBE FOR OPEN-END SPINNING MACHINES

Gerhard Egbers, Eningen, and Peter Artzt, Reutlingen, both of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Sept. 5, 1975, Ser. No. 610,662

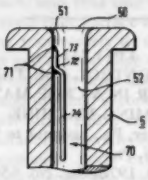
Claims priority, application Germany, Sept. 21, 1974, 2445206

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.89 **4 Claims**

1. In an open-end spinning machine, a spinning rotor having an annular fiber-collection surface, a thread drawoff tube having a bore therethrough disposed with its axis substantially perpendicular to a plane of the fiber-collection surface, and thread drawoff means for drawing off thread formed in the spinning rotor through the drawoff tube bore and thereby bending the thread around the drawoff tube infeed mouth, the improvement comprises plucking means in the drawoff tube

bore at a location spaced from the drawoff tube infeed mouth for periodically plucking the thread portion extending through



the tube bore, and mounting means for mounting said plucking means in the drawoff tube bore.

4,011,713

BATTERY POWERED ELECTRONIC TIMEPIECE WITH VOLTAGE REGULATION

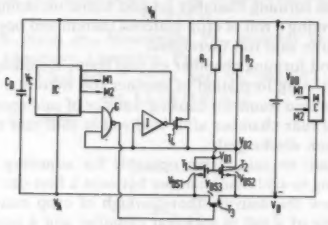
Pierre A. Sauthier, Bruegg, and Werner Fehr, Zurich, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

Filed June 17, 1975, Ser. No. 587,726

Claims priority, application United Kingdom, July 15, 1974, 31255/74

Int. Cl.² G04C *3/00*; H02J *1/00*

U.S. Cl. 58—23 BA **10 Claims**



1. In a battery powered electronic timepiece of the type having an oscillator for generating high frequency electric pulses, a frequency divider responsive to said high frequency electric pulses for producing low frequency electric pulses, a stepping motor responsive to said low frequency electric pulses for driving a display means, and a battery for energizing said oscillator, frequency divider and the stepping motor, the improvement comprising: a capacitor coupled to said oscillator and said frequency divider; and a switch means controlled by pulses from said frequency divider for providing a low resistance path from the battery to the condensor in the intervals between motor stepping pulses and a high resistance path from the battery to the condensor during motor stepping pulses, whereby during motor stepping pulses the oscillator and frequency divider are energized substantially entirely from the capacitor.

4,011,714

DEVICE FOR MAINTAINING THE OSCILLATION OF A BALANCE FOR A TIMEPIECE

Tsutomu Ishizuka, Noda, and Seiji Ichikawa, Aizuwakamatsu, both of Japan, assignors to Rhythm Watch Co. Ltd.

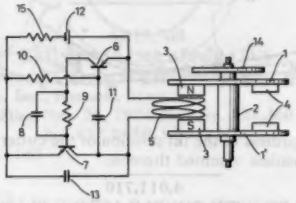
Filed Mar. 17, 1975, Ser. No. 558,857

Claims priority, application Japan, Mar. 19, 1974, 49-30827[U]; Aug. 30, 1974, 49-103307[U]

Int. Cl.² G04C *3/04*

U.S. Cl. 58—28 R **4 Claims**

1. A device, for maintaining the oscillation of a balance of a timepiece, comprising, in combination, a rotatably mounted balance wheel formed of two concentric axially spaced discs; two permanent magnets each secured on a respective disc with their poles of respective different polarities facing each other; a stationary coil electromagnetically coupled to said magnets and combining pick-up and driving functions; two complementary transistors, each including a base, a collector and an emitter; a single RC circuit included in said device and connecting the collector of one transistor to the base of the other transistor; said single RC circuit consisting of a first condenser and a first resistor connected in parallel; a second resistor and a second condenser having first terminals connected to the base of said one transistor, and having second terminals; a DC power source, a third resistor having a first



terminal connected to one terminal of said power source; the second terminal of said second resistor being connected to the second terminal of said third resistor and to the emitter of said other transistor; the second transistor of said second condenser being connected to one terminal of said coil; and the collector of said other transistor; a third condenser connected between a first junction point, connecting the second terminal of said second resistor to the emitter of said other transistor, and a second junction point, connecting the second terminal of said second condenser to said one terminal of said coil; the emitter of said one transistor being connected to the other terminal of said power source and to the other terminal of said coil.

4,011,715

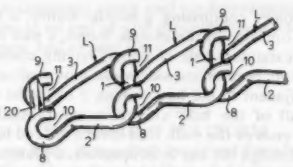
CHAIN LINK

Edward A. Graetz, Pound, Wis., assignor to Graetz Manufacturing, Inc., Pound, Wis.

Filed Nov. 28, 1975, Ser. No. 635,874

Int. Cl.² F16G *15/04*

U.S. Cl. 59—85 **4 Claims**



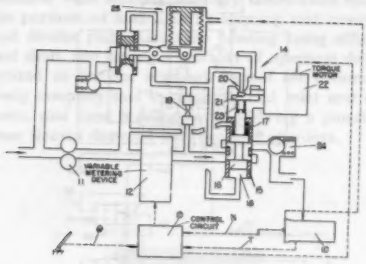
1. A generally U-shaped chain link fabricated from a rod of metal and having a transverse bight portion with a pair of legs extending therefrom, said legs each having a free end and having a hook formed at said free end, said hooks defining with their respective legs a relatively narrow opening, said legs adjacent said bight portion each having a transverse slot-like recess extending thereacross so as to form a narrower portion of said leg which is of a thickness less than said opening, said legs being curved and including a first portion adjacent said bight portion and a second portion adjacent said hook, the first portions of said pair of legs defining a first plane and the second portions of said pair of legs defining a second plane disposed at an angle with respect to said first plane whereby the links must be folded together completely to permit their separation and the length of said transverse bight portion being greater than the transverse distance defined by said hooks.

4,011,716

FUEL CONTROL SYSTEM FOR GAS TURBINE ENGINE

Trevor Stanley Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 3, 1975, Ser. No. 564,606
Claims priority, application United Kingdom, May 21, 1974, 22533/74
Int. Cl.² F02C 9/10
U.S. Cl. 60—39.28 R 5 Claims



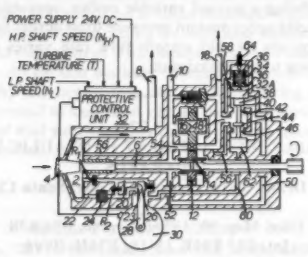
1. A servo-operated shut-off valve for a gas turbine engine fuel control system, comprising a main valve having a control element movable in first and second directions in response to an increase and a decrease respectively in a servo pressure signal, a pivot valve including a control member movable in a first direction to increase said servo pressure signal and in a second direction to decrease said servo pressure signal, and a resilient coupling between said control element and said control member, said coupling acting, when said control element moves in its first direction, to urge said pilot valve in its first direction, and when said control element moves in its second direction to urge said pilot valve in its second direction.

4,011,717

CONTROL SYSTEM FOR A GAS TURBINE

Horace George Turner, Chandler's Ford, and Robert Spurgeon Wood, Gosport, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Nov. 22, 1974, Ser. No. 526,163
Claims priority, application United Kingdom, Nov. 23, 1973, 54491/73
Int. Cl.² F02C 9/08
U.S. Cl. 60—39.28 R 3 Claims



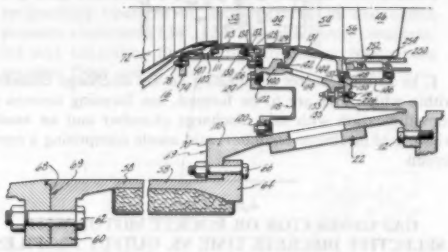
1. A control system for an aircraft gas turbine engine, which control system comprises a fuel pressurising impeller which is driven as a function of the engine speed, two fuel flow restrictors which are each of a fixed size and which are supplied with fuel at different pressures from the impeller, a common fuel conduit which is in communication with said restrictors and which receives fuel at a pressure dependent upon the relative sizes of said restrictors, electrically actuated means for varying the fuel pressure in the common fuel conduit, and fuel flow control means which is operated according to the varying fuel pressure in the common fuel conduit and which is effective to control the fuel flow for the engine thereby to control the output of the engine.

4,011,718

GAS TURBINE CONSTRUCTION

Herbert Frederick Asplund, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 1, 1975, Ser. No. 601,564
Int. Cl.² F02C 7/00; F01D 9/00
U.S. Cl. 60—39.31 18 Claims



18. A gas turbine engine having:

A. an outer case concentric about an axis,

B. a two-stage gas turbine enveloped within said outer case and comprising:

1. axially spaced first and second stage stator assemblies,
2. a first stage rotor assembly positioned between said stator assemblies,
3. a second stage rotor assembly positioned immediately adjacent said second stage stator assembly and on the opposite side thereof from said first stage rotor assembly.

C. means to support said rotor and stator assemblies so that the blades of said rotor assemblies and the vanes of said stator assemblies are in axial alignment,

D. means to provide forward access to said turbine through an opening in said case,

E. means supporting the first stage vanes so that, without disassembling any other parts of said engine, the first stage vanes may be disconnected and removed through said case opening,

F. means supporting said first stage blades so that, with the first stage vanes removed and without disassembling any other parts of said engine, the first stage blades may thereafter be disconnected and removed through said case opening,

G. means supporting said second stage vanes so that, with the first stage vanes and blades removed and without disassembling any other parts of said engine, the second stage vanes may thereafter be disconnected and removed through said case opening, and

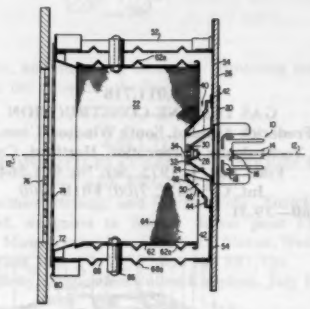
H. means supporting said second stage blades so that, with said first stage vanes and blades, and said second stage vanes removed, and without disassembling any other parts of said engine, said second stage blades may thereafter be disconnected and removed through said case opening.

4,011,719

ANODE FOR ION THRUSTER

Bruce A. Banks, Olmsted Township, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 8, 1976, Ser. No. 665,033
Int. Cl.² F02K 9/00
U.S. Cl. 60—202 4 Claims



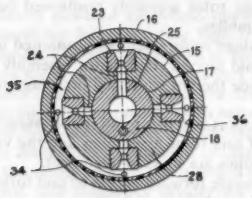
1. In an ion thruster comprising an ion discharge chamber within which ions are to be formed, ion focusing screens in communication with said discharge chamber and an anode within said discharge chamber, said anode comprising a mesh screen.

4,011,720

GAS GENERATOR OR ROCKET MOTOR WITH SELECTIVE DISCRETE TIME VS. OUTPUT PROFILES

Thomas J. Kirschner, Jr., Port Deposit, Md., assignor to Thiokol Corporation, Newtown, Pa.

Filed May 13, 1975, Ser. No. 577,123
Int. Cl.² F02K 9/04
U.S. Cl. 60—254 4 Claims



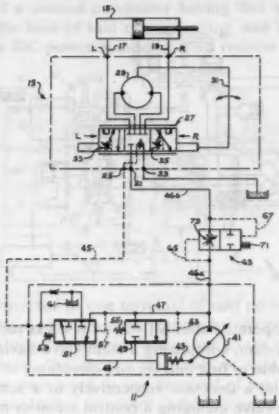
3. In a rocket motor having variable flow rates and thrust output, a combustion chamber closed at one end, a solid gas producing propellant contained therein, ignition means therefor, a head enclosing the opposite end of the combustion chamber, the improvement comprising, in combination, a bore in said head, a rotor disposed in said bore in said head and adapted for rotation therein to various selective positions, passage means in said rotor in communication with said combustion on chamber and passing radially through a side wall of said rotor, substantially gas-tight seals between said rotor and said head on opposite sides of said passage means, a plurality of primary nozzles having their longitudinal axes radially disposed in said head and separately in communication with said rotor passage means when the rotor is selectively rotated to its various positions and each of said primary nozzles having different throat cross-sectional areas, means attaching said head to the combustion chamber, means collecting gas passed through said primary nozzles and at least one exit nozzle extended through said head attaching means and in communication with said gas collecting means.

4,011,721

FLUID CONTROL SYSTEM UTILIZING PRESSURE DROP VALVE

James Kwok-Fun Yip, Richfield, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 14, 1976, Ser. No. 676,831
Int. Cl.² F16H 39/46
U.S. Cl. 60—445 9 Claims



1. A system for controlling the flow of fluid from a variable fluid delivery source to a fluid actuated device, said system comprising:

a. first valve means in fluid communication with the variable fluid delivery source and with the fluid actuated device, said first valve means including a first orifice variable between a minimum orifice area corresponding to a minimum system flow rate and a maximum orifice area corresponding to a maximum system flow rate;

b. means for maintaining the variable fluid delivery source output pressure at a generally constant level above the load on the fluid actuated device as said first orifice varies from said minimum orifice area to said maximum orifice area;

c. second valve means being in series flow relationship between the variable fluid delivery source and said first variable orifice of said first valve means;

d. said second valve means including a valve member biased towards a closed position in the absence of at least a predetermined minimum fluid pressure, said valve member defining a second variable orifice operable to maintain a relatively constant pressure drop across said second valve means as said system flow rate varies from said minimum to said maximum.

4,011,722

VARIABLE DISPLACEMENT HYDRAULIC PUMP APPARATUS

J. Howard Drake, 2619 Lindentree Lane, Santa Clara, Calif. 95051

Filed May 10, 1976, Ser. No. 684,638
Int. Cl.² F15B 15/18; F16H 39/46
U.S. Cl. 60—465 12 Claims

1. A hydraulic pump comprising:

a housing having first and second facing, spherically surfaced, concentric wall portions cooperating with an end wall portion to form an annular cavity;

a divider plate affixed to one end of said housing and having fluid inlet and outlet ports therein disposed in spaced apart facing relationship with said end wall portion;

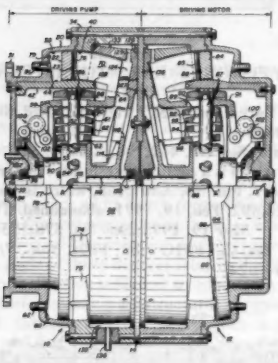
an annular control ring disposed within said cavity and mounted to rotate therewithin about a diameter thereof

which passes through the geometrical center point of said concentric wall portions, one side of said control ring cooperating with said end wall portion and parts of said first and second wall portions to form at least one hydraulic ring control chamber, and another side of said control ring cooperating with other parts of said first and second wall portions to form a hydraulic working chamber;

an elongated shaft extending into said housing with its axis passing through said center point;

a rotor assembly affixed to said shaft and including

an annular vane housing sealingly sandwiched between the portions of said housing forming said cavity and said divider plate, said vane housing being affixed to said shaft, and having a plurality of openings disposed around an annular segment thereof for communicatively coupling said cavity with said inlet and outlet ports, said vane housing further having a plurality of vane sleeves disposed between said openings,



a hub and pin assembly affixed to said shaft and including a plurality of elongated pins extending radially outwardly from said shaft with their center lines disposed in a plane normal to the axis of said shaft at said center point,

a plurality of concentric gimbal rings disposed about said shaft with each such ring being pivotally attached to a pair of said pins,

a plurality of vanes attached to various ones of said gimbal rings, said vanes each being disposed within one of said sleeves and extending through said working chamber into engagement with said other side of said control ring to divide said working chamber into subchambers, whereby the positioning of said control ring at other than normal to said shaft causes the volumetric dimensions of said subchambers to vary as said rotor assembly revolves.

4,011,723

FLUID POWER SYSTEM

James J. Ross, 28715 Barkman, Roseville, Mich. 48066

Filed June 28, 1974, Ser. No. 484,342

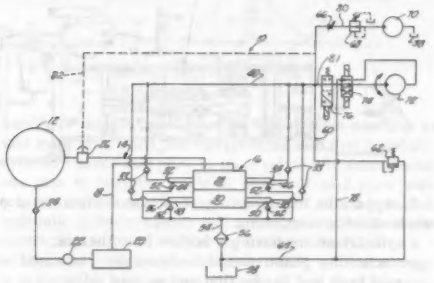
Int. Cl.² F05B *11/16*

U.S. Cl. 60—486 **2 Claims**

1. A fluid power system comprising, in combination:

a steam generator (12) and a first conduit means (14) connecting the steam generator (12) to a steam driven hydraulic pump (16);

said steam driven hydraulic pump (16) comprising a housing (100,100′) having a first bore (102) within which is reciprocally mounted a first piston (108) dividing said first bore (102) into opposing first and second chambers (104, 106) alternately communicable with said steam generator (12); valve means (116) for selectively communicating said steam generator (12) to said opposing first and second pressure chambers (104, 106) so as to reciprocate said first piston (108) within said first bore (102); said first piston (108) having oppositely-extending coaxially disposed first and second piston means (130,132), the outer ends of which are disposed for reciprocal movement in opposing third and fourth pressure chambers (134,136) and which alternately compress and expand fluid therein for delivering pressurized fluid from one of said third and fourth pressure chambers (134,136) while fluid is drawn into the other of said third and fourth pressure chambers (134,136); a second bore (102′) disposed in said housing (100,100′); said second bore (102′) containing a second piston (108′) which divides said second bore (102′) into opposing fifth and sixth pressure chambers (104′, 106′) that are communicable with said steam generator (12); valve means (116′) for communicating said opposing fifth and sixth pressure chambers (104′, 106′) that are communicable with said steam generator (12); said second piston (108′) having opposing coaxially extending piston means (130′, 132′) reciprocally operable in opposing seventh and eighth pressure chambers (134′, 136′) for alternately compressing and expanding fluid therein to deliver fluid under pressure from one of said opposing fifth and sixth pres-



sure chambers (104′, 106′) while the other of said opposing fifth and sixth pressure chambers (104′, 106′) receives fluid at a low pressure; third means (110, 112, 114, 122′, 124′, 126′) associated with said first piston in said first mentioned bore (102) which are operable to actuate the valve (116′) associating with said second mentioned piston (108′) to communicate pressure to a select one of the fifth and sixth pressure chambers (104′, 106′) associated therewith; and fourth means (110′, 112′, 114′, 122, 124, 126) associated with said second piston (108′) which are operable upon actuation and after a selected movement of said second piston (108′) for operating said first mentioned valve (116) with selectively communicating fluid under pressure to one of said pressure chambers (104, 106) associated with said first mentioned piston (108) whereby said first and second pistons (108, 108′) are reciprocable in opposite directions for delivering fluid under pressure to a plurality of fluid circuits;

said fluid power system further comprising second conduit means (18) connecting the steam driven hydraulic pump (16) to said steam generator (12) via a condenser (20);

a first fluid circuit (81) connecting the hydraulic output of said steam driven hydraulic pump (16) to a plurality of first rotary bidirectional hydraulic motors (72);

first means (74) disposed between said hydraulic pump output and said first rotary bidirectional hydraulic motors (72) for controlling the direction of flow between said steam driven hydraulic pump (16) and said first rotary bidirectional hydraulic motors (72) and a reservoir (58)

to which the inlet of said steam driven hydraulic pump (16) is connected;

a second fluid conduit (60) comprising a relief valve (62) for limiting the pressure at which fluid is delivered from said steam driven hydraulic pump (16), the outlet of said relief valve (62) being connected to said reservoir (58); and

a third fluid conduit (80) comprising a pressure regulating valve (68) and a variable flow control valve (66) for maintaining the pressure and rate of flow of fluid to a second rotary hydraulic motor (70) at a predetermined value; and

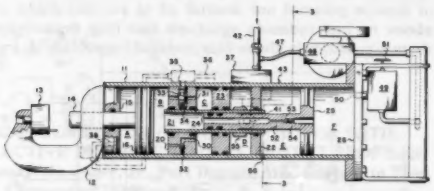
second means (82, 26) disposed between said fluid circuits (81, 60, 80) and said steam generator (12) for sensing the load on said plurality of first rotary bidirectional hydraulic motors (72) for controlling the steam generated by said steam generator (12).

4,011,724

DUAL FORCE ACTUATOR

Ralph K. Landes, Atlanta, and William E. Thomas, Marietta, both of Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Sept. 16, 1971, Ser. No. 181,176
Int. Cl.² F15B *3/00*
U.S. Cl. 60—567 **5 Claims**



1. Apparatus for operating an actuator member at plural levels of force comprising:

a cylinder means having a hollow bore therein;

an actuating piston means reciprocally contained within said bore and having first and second sides;

an actuating means operably connected to said cylinder means;

a first pressure controlled means contained within said cylinder means and operative to produce and apply fluid pressure to said first side of said actuating piston means at a first level of pressure, said first pressure controlled means including a first pressure producing piston slidably contained within said cylinder means and slidably movable to selectively exert said first level of fluid pressure on said first side of said actuating piston means;

a second pressure controlled means contained within said cylinder means and operative to produce and apply fluid pressure to said first side of said actuating piston means at a second level of pressure higher than said first level of pressure, said second pressure controlled means including a second pressure producing piston contained within said cylinder in axial alignment with said first pressure producing piston and slidably movable to selectively exert said second level of fluid pressure on said first side of said actuating piston means, said second level of pressure produced by said second pressure controlled means adapted to become operative on said actuating piston means without releasing said first level of pressure produced by said first pressure controlled means whereby said first level of pressure becomes amplified and once established is continuous until amplified;

pressure release means for removing fluid pressure from said first side of said actuating piston means;

means for exerting a fluid pressure on the second side of said actuating piston means to return said actuating piston means to a retracted position upon release of fluid pressure on said first side of said actuating piston means;

a first partition means fixedly disposed within said cylinder means to separate said actuating piston means and said first pressure producing piston;

a first fluid passage means contained in said first partition means to establish communication between the first pressure piston side and the actuating piston means said of said first partition means; and

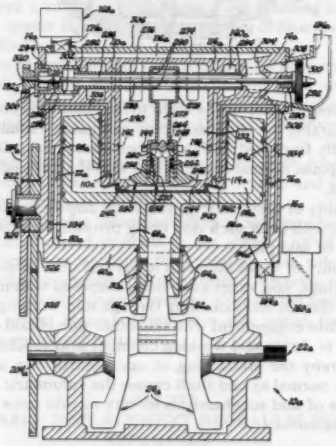
one-way valve means contained in said first passage means to permit fluid to flow only from said first pressure piston side of said first partition means to said actuating piston means side thereof.

4,011,725

ANNULAR PISTON ENGINE WITH AFTERBURNER AND POWER TURBINE

William V. Bachmann, 22517 Ten Mile Road, St. Clair Shores, Mich. 48080

Division of Ser. No. 462,790, April 22, 1974, Pat. No. 3,885,386, which is a continuation-in-part of Ser. No. 363,247, May 23, 1973, Pat. No. 3,807,168, which is a continuation of Ser. No. 116,892, Feb. 19, 1971, abandoned. This application May 19, 1975, Ser. No. 578,555
Int. Cl.² F02G *3/02*; F02C *3/00*, *7/00*
U.S. Cl. 60—624 **17 Claims**

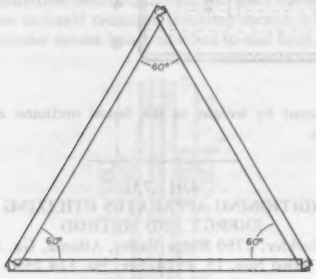


1. In a composite internal combustion engine having engine housing means, reciprocating power piston means and power turbine assembly means, the improvement of having said engine housing means comprising first and second engine housing section means, wherein said first engine housing section means carries said power turbine assembly means therein, wherein said first and second engine housing section means cooperate when in assembled relationship to define axially extending cylinder walls for the reciprocating reception therein of said piston means, wherein one of said cylinder walls is carried by said first engine housing section means, and wherein said first engine housing section means operatively forms closure wall means at one end of said axially extending cylinder walls.

4,011,726
DELTA CULVERT

Glenn A. Cooper, Jr., Springfield, Va., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 5, 1975, Ser. No. 629,477
Int. Cl.² E02B *11/00;* **F16L** *9/22*
U.S. Cl. 61—16 **2 Claims**



1. The constructional wall section of a tubular article in the form of a three-sided culvert, the said wall section fabricated by bonding together with a waterproof, cold setting, resorcinol-resin adhesive, a plurality of individual structural components, each of said structural components defined individually as an elongated member shaped as a regular right parallelipiped with square cross section; said member notched at one end only with a face width notch formed by two intersecting cuts, to wit, a first cut beginning at the edge intersection of an end and a face of the member and extending into the member, at an angle of thirty degrees relative the face plane of the member, for a distance sufficient to completely accept the unnotched end of a counterpart structural component member, the notch subsequently completed with a second cut perpendicular said first cut and extending from the bottom of the said first cut to the aforementioned member face with which face the plane of the said second cut will exhibit an angle of sixty degrees, all components with notched faces in the same plane, all adjacent components with notched ends and unnotched ends alternating, and all components with notched ends uniformly extending beyond adjacent component unnotched ends a distance substantially one-half the face width of a component, the term plurality for claim purposes in this application being restricted numerically to even whole numbers thereby to produce 3 separate constructional wall section groups, the groups namely a first group of at least two units composed of an even number of structural components, a second group of at least two units composed of structural components double in number the components of the first group and a third group composed of structural components triple in number the components of the first group.

4,011,727
MOVABLE CABLE PLOW FOR CONSTRUCTING UNDERWATER CABLE

Kinya Suzuki; Kenji Mori, both of Tokyo; Yasuo Takeuchi; Yuzo Tokumaru, both of Yokohama; Kichizo Noji; Yutaka Okada, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo; Sumitomo Electric Industries, Ltd., Osaka and Sumitomo Heavy Industries, Ltd., Tokyo, all of Japan

Filed July 25, 1975, Ser. No. 599,230
Claims priority, application Japan, July 26, 1974, 49-85108; July 26, 1974, 49-85109
Int. Cl.² B63B *35/04;* **E02F** *5/02, 5/18*
U.S. Cl. 61—72.4 **3 Claims**

1. Apparatus for dredging a groove in a sea bed for depositing an underwater cable in the groove, said apparatus comprising:

a main body towable horizontally along a surface of the sea bed,

a plow for dredging the groove in the sea bed,

attachment means for attaching said plow to said main body such that said plow extends vertically with respect thereto,

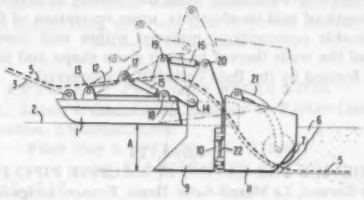
said attachment means comprising at least one Y-shaped arm,

means for pivoting the non-forked end of said at least one arm to said main body for pivoting in the plane of the arm about a horizontal axis, so as to provide a vertically upper and lower fork for said arm at the rear end of said main body,

means for pin connecting the lower fork to said plow intermediate of its ends, for pivoting said plow about a horizontal axis relative to said at least one arm,

a first hydraulic cylinder pin connected at one end to said upper fork of said at least one arm and pin connected at the other end to said plow above the pin connection between said plow and said lower fork, and

a second hydraulic cylinder secured at one end to said main body and at the other end to said at least one arm rear-



wardly of the pin connection of said at least one arm to said main body such that operation of said first hydraulic cylinder causes said plow to pivot relative to said at least one arm to vary the angle of attack of said plow with respect to said sea bed and operation of said second hydraulic cylinder causes said arm to pivot about its pin connection to pivot relative to said main body,

whereby, said plow may be lifted vertically without change in orientation with respect to said sea bed during operation, and

a planar cable guide member and torsion bar hinge means for mounting said planar guide member to the rear of said plow such that said guide member extends vertically and constitutes an extension of said plow and pivots about a vertical axis under the restraint of said torsion bar,

whereby, when the direction in which the plow is towed is changed to avoid an obstacle or hard ground, only the plow is required to travel in the new direction with the cable guide member pivoting laterally with respect to the plow under the torsion bar restraint to minimize transmission of lateral forces to the main body to ease the change in direction of the plow and to minimize the danger of the plow tipping.

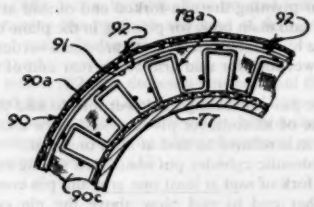
4,011,728
MEANS FOR PRODUCING SUBAQUEOUS AND OTHER CAST-IN-PLACE CONCRETE STRUCTURES IN SITU

Lee A. Turzillo, 2078 Glengary Road, Akron, Ohio 44313

Division of Ser. No. 542,050, Jan. 17, 1975, which is a division of Ser. No. 44, Jan. 24, 1970, Pat. No. 3,726,950, which is a continuation-in-part of Ser. No. 647,026, June 19, 1967, abandoned, which is a continuation-in-part of Ser. No. 365,431, May 6, 1964, Pat. No. 3,345,824. This application Mar. 18, 1976, Ser. No. 668,231
Int. Cl.² E02D *7/00, 5/34, 5/64*
U.S. Cl. 61—86 **4 Claims**

1. A mold for forming cast-in-place concrete or like body from fluid, self-hardenable cementitious material to given

shape and size in a subaqueous or other situs comprising: a flexible walled, bag-like container, a self-supportingly rigid matrix of openwork material received within said container, means for maintaining said matrix fixedly positioned at the situs, means for supporting said container with opposing walls in coextending relation to said fixedly positioned matrix, tension-restraining tie-elements of predetermined length con-



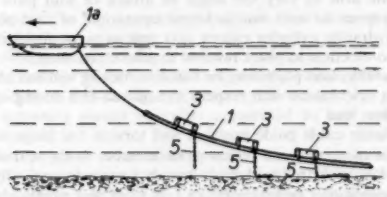
nected between said matrix and opposing walls of said container for controlling limited oppositely outward distension of said opposing walls away from said matrix as determined by the length of said tie-elements, upon receiption of fluid self-hardenable cementitious material within said container to expand the walls thereof to such given shape and size of the body formed by the fluid cementitious material.

4,011,729

DEVICE FOR LAYING SUBMARINE PIPELINES

Louis Kermel, Le Mesnil-Saint-Denis, France, assignor to C. G. Doris, Paris, France

Filed Sept. 23, 1975, Ser. No. 616,018
Claims priority, application France, Oct. 3, 1974, 74.33292
Int. Cl.² F16L *1/00*
U.S. Cl. 61—112 **4 Claims**



1. Apparatus for recovering guide chains in a device for laying a submarine pipeline comprising means for towing the pipeline and displacing it parallel to the sea bed, comprising in combination, a float, attaching means for removably attaching said float to said pipeline, a chain, means securing said chain to said float, and release means separating the float from said pipeline to carry therewith said chain to the surface.

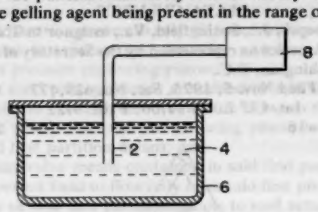
4,011,730

GELLED CRYOGENIC LIQUIDS AND METHOD OF MAKING SAME

Sanders D. Rosenberg, Sacramento, and Eugene M. Vanderwall, Citrus Heights, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Continuation-in-part of Ser. No. 36,416, May 11, 1970, abandoned. This application Apr. 28, 1975, Ser. No. 572,240
Int. Cl.² F25C *3/00*
U.S. Cl. 62—1 **20 Claims**

1. A gelled cryogenic liquid composition consisting essentially of at least one of liquid methane and liquid natural gas and of a gelling agent taken from the class consisting of finely divided ice particles and finely divided methyl alcohol particles, the gelling agent being present in the range of 0.1 percent



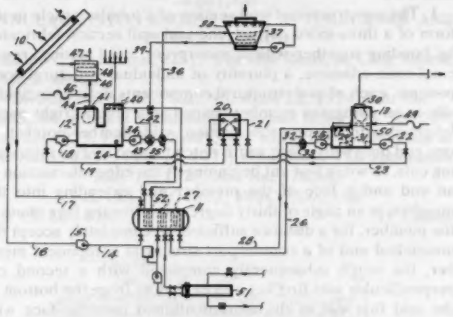
to 3.0 percent by weight of the liquid methane and liquid natural gas.

4,011,731

AIR CONDITIONING APPARATUS UTILIZING SOLAR ENERGY AND METHOD

Gershon Meckler, 2750 Ridge Valley, Atlanta, Ga. 30326

Filed Nov. 15, 1974, Ser. No. 524,255
Int. Cl.² F25B *27/00*
U.S. Cl. 62—2 **11 Claims**



1. Apparatus for conditioning air comprising, in combination, a contactor, means for circulating air to be conditioned to said contactor in contact with an aqueous hygroscopic solution, a hygroscopic solution regenerator, means for circulating a concentrated hygroscopic solution from said regenerator to said contactor, means for circulating a dilute hygroscopic solution from said contactor to said regenerator, means for circulating regenerating air through said regenerator in contact with the hygroscopic solution therein whereby such solution is concentrated, a solar collector, means for transferring heat from said solar collector to the hygroscopic solution being regenerated in said regenerator, an absorption refrigerator including a generator and an evaporator, means for transferring heat from said solar collector to said generator, a heat exchange coil located in said evaporator to be cooled by refrigerant, and means for removing heat from the hygroscopic solution which contacts air circulated through said contactor including means for circulating a controlled portion of the hygroscopic solution in said contactor through said heat exchange coil.

4,011,732

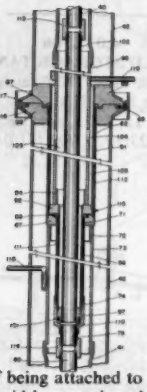
HEAT-STATIONED BAYONET CONNECTOR FOR CRYOGENIC FLUID LINES

Paul R. Doherty, Woburn, and Robert W. Johnson, Holbrook, both of Mass., assignors to Helix Technology Incorporated, Waltham, Mass.

Filed Feb. 14, 1974, Ser. No. 442,326
Int. Cl.² F17C *7/02*
U.S. Cl. 62—55 **23 Claims**

1. In a heat-stationed bayonet connector suitable for joining cryogenic fluid transfer lines including male and female sec-

tions engageable to form a continuous cryogenic liquid process line with a radiation shielding means therearound for shielding radiation therefrom, the improvement comprising: a support means for supporting the connector outside the radiation shielding means; a heat station means for intercepting heat flow, said heat station means being positioned on said radiation shielding means and bonded thereto; a first tubular means located between and concentric with said process line and said radiation shielding means for inter-connecting said process line and said radiation shielding means, a first end of said first tubular means being attached to said heat station and



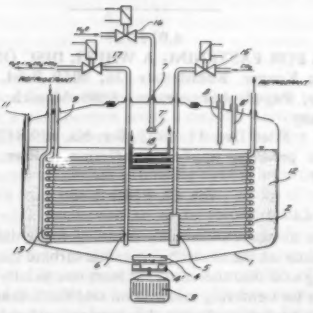
a second end thereof being attached to said process line at a position offset from said heat station along said process line; and a second tubular means located outside and concentric with said radiation shielding means for interconnecting said radiation shielding means to said support means, a first end of said second tubular means being attached to said heat station and a second end thereof being adapted for attaching to said support means, at a position offset from said heat station along said process line, whereby when said radiation shielding means are cooled said heat station means is cooled to intercept heat flow from said support means to said process line.

4,011,733

APPARATUS AND PROCESS FOR CARBONATING LIQUIDS

Alexander Kückens, Hamburg, and Horst Kohl, Reinfeld, both of Germany, assignors to DAGMA GmbH & Co., Reinfeld, Germany

Filed July 29, 1975, Ser. No. 600,063
Int. Cl.² F25D *11/00*
U.S. Cl. 62—59 **22 Claims**



1. An apparatus for carbonating liquids, particularly for carbonating beverages, comprising a container; cooling means in said container and operative for forming at the interior and the exterior of said cooling means a respective interior and exterior surrounding ice layer; first admitting means and second admitting means operative for admitting a carbonating gas and a liquid into said container for thermal contact with at least said interior ice layer so as to be cooled and mixed therein; means for dispensing the mixture from said container; and means for maintaining said interior ice layer at a thickness which is smaller than the thickness of said exterior ice layer.

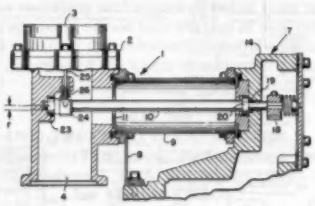
8. An apparatus for carbonating liquids, particularly for carbonating beverages, comprising a container; cooling means in said container and operative for forming at the interior and the exterior of said cooling means a respective interior and exterior surrounding ice layer, said cooling means is connected to said container and forms a first electrode means; first admitting means and second admitting means respectively operative for admitting a carbonating gas and a liquid into said container for thermal contact with at least said interior ice layer so as to be cooled and become mixed therein to form a carbonating gas-liquid mixture; means for dispensing said mixture from said container; and means for preventing the thickness of at least said interior ice layer from exceeding a predetermined thickness, said means including second electrode means insulated from said container and cooperating with said first electrode means.

4,011,734

CRYOGENIC PRESSURE REGULATOR

Robert L. Jones, Irvine, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed May 8, 1975, Ser. No. 575,627
Int. Cl.² F25B *49/00*
U.S. Cl. 62—132 **2 Claims**



1. A pressure regulator comprising a body having a passage therethrough including an inlet adapted for connection to a fluid pressure source and an outlet; an inlet valve in said body including small and large valve members spring-biased to close said passage and being movable to define respective small and large variable area orifices; a valve actuator in said body having one side exposed to fluid under pressure downstream of said outlet and movable thereby according to the magnitude of such fluid under pressure; and motion transmitting means operatively engaged with said actuator and inlet valve to sequentially actuate said small and large valve members to successively progressively increase the flow areas of the respective variable area orifices responsive to movement of said actuator in one direction by decreasing downstream fluid pressure; said actuator comprising a flexible diaphragm which is spring-biased in such one direction; said motion transmitting means comprising a central axially extending rod on said diaphragm; a crankshaft journaled in said body having a crank arm at one end pivotally connected to said rod and having a cam at the other end; a cam follower engaged with said cam to sequentially engage said small and large valve members responsive to turning of said crankshaft in one direction by movement of said diaphragm in said one direction thus to progressively increase the small variable area orifice to predetermined maximum size and then to progressively increase the large variable area orifice; the radius of said crank arm being several times the radius of engagement of said cam and follower to produce a large mechanical advantage of actuator force to cam follower force to provide a narrow

pressure control band despite large variations in inlet fluid pressures and flow demands; said body comprising separate parts for said inlet valve and for said actuator; said body parts being connected together by means which thermally isolate the body part containing said actuator from the body part containing said inlet valve in the case of connection of said inlet to a cryogenic fluid pressure source; said crankshaft being elongated between said arm and said cam and extending laterally of said outlet; said body parts having spaced-apart portions, and a spacer tube surrounding the crankshaft between said arm and cam and extending between said spaced-apart portions to define a laterally extending pocket open at one end to said passage downstream of said inlet valve and closed at the other end; said means for thermally isolating said body parts from each other comprising said spacer tube and crankshaft being of material having a low thermal conductivity.

4,011,735

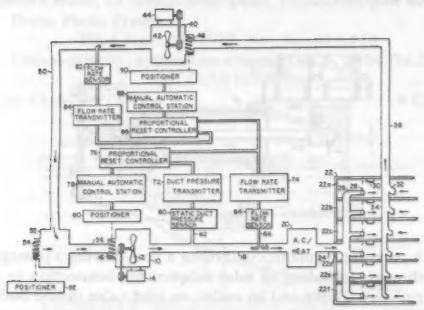
BLOWER SYSTEM AND CONTROL SYSTEM THEREFOR

Lyle F. Martz, Verona, and John W. Nanz, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 420,483, Nov. 30, 1973, abandoned, and a continuation of Ser. No. 359,398, May 11, 1973, abandoned, which is a continuation of Ser. No. 265,385, June 22, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,590

Int. Cl.² F24F *3/02*

U.S. Cl. 62—186 **7 Claims**



1. A blower system for a central air conditioning installation servicing a facility having variable air supply flow rate requirements in accordance with attaining desired atmospheric conditions within each portion of the facility serviced by the installation, comprising:

a supply blower,

duct means connected to said supply blower for receiving and conveying an air supply flow from said supply blower to air conditioning means, the air as conditioned therein being supplied to said facility,

first sensing means communicating with said duct means for sensing the air supply flow rate therewithin and producing a first pneumatic signal representative thereof,

second sensing means communicating with said duct means for sensing the static duct pressure therewithin as corresponding to the discharge pressure of said supply blower and producing a second pneumatic signal representative thereof,

a proportional plus reset controller,

means for transmitting the first pneumatic signal to said proportional plus reset controller as a set point signal, and for transmitting the second pneumatic signal to said proportional reset controller as a feedback signal,

said transmitting means including tuning means for adjusting said first and second pneumatic signals in accordance with a predetermined desired relationship of the discharge pressure of said supply blower and the supply flow rate,

said proportional plus reset controller being operable to produce a pneumatic output control signal dependent on the difference between the feedback pneumatic signal and the set point pneumatic signal, and

adjustment means responsive to the pneumatic output control signal of said proportional plus reset controller for adjusting the output of said supply blower to establish said desired relationship of the discharge pressure of said supply blower with respect to the supply flow rate.

4,011,736

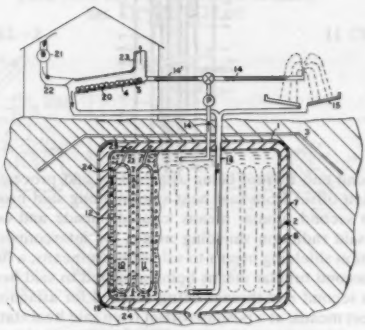
COLD STORAGE TANK

Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,057

Int. Cl.² F25D *23/12, 17/02, 11/04*; B65G *5/00*

U.S. Cl. 62—260 **9 Claims**



1. Cold storage tank means mounted in a pit in the ground, said pit having continuous sides and a bottom,

a lining of incompressible insulation on the interior surface of said pit,

an inner tank lining the interior surface of said insulation,

a rigid cellular structure substantially filling said inner tank,

a plurality of bags of freezable liquid mounted inside the cells of said rigid cellular structure,

low freezing point liquid substantially filling said inner tank and the voids surrounding said liquid bags,

first heat exchange means for removing heat from said low freezing point liquid to freeze said freezable liquid,

and second heat exchange means for adding heat to said low freezing point liquid to melt said freezable liquid, thereby producing a useful cooling effect.

4,011,737

DEVICE FOR FASTENING A WHEEL DISC ON A SHAFT

Wolfgang Kruger, Kohlstattstr. 26, 8069 Priel, and Hagen Hanser, Pagodenburg-strasse, 8000 Munich 60, both of Germany

Filed Dec. 11, 1975, Ser. No. 639,817

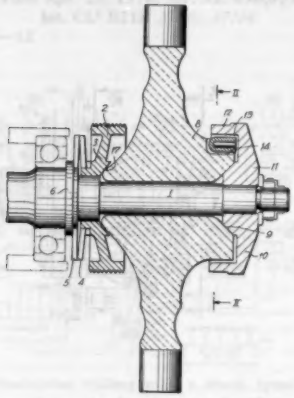
Claims priority, application Germany, Dec. 21, 1974, 2460739

Int. Cl. F16D *3/18*

U.S. Cl. 64—9 A **2 Claims**

1. In a torque-transmission coupling for a disc formed of brittle material, particularly a ceramic turbine disc, a shaft for mounting said disc thereonto, at least one axially pre-stressed cone pair for centering said disc on said shaft, said disc including a hub having a cylindrical extension, said extension being formed with profiled longitudinal grooves on the outer periphery thereof, said grooves having respective side walls, a cylindrical coupling bell having a bore and a coupling region and

being rigidly fastened to said shaft, profiled longitudinal protuberances having concave side edges, said protuberances fitting into and engaging said longitudinal grooves within said bore for torque transmission, the improvement comprising said at least one axially pre-stressed cone pair being disposed in the coupling region of said coupling bell, and rollers radially and



tangentially fitting between said concave side edges of said longitudinal protuberances and said side walls of said longitudinal grooves, respectively, for torque transmission distributed uniformly over the circumference of the coupling bell to said shaft through centrifugal force utilization, whereby thermal stresses between said disc of brittle material and said shaft, said cone pair, and said coupling bell are prevented.

4,011,738

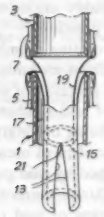
MANUFACTURING OF PANTYHOSE OR TIGHTS USING A CIRCULAR KNITTING MACHINE

Edoardo Furia, Florence, Italy, assignor to Nova Tec Establishment, Liechtenstein

Continuation-in-part of Ser. No. 171,169, Aug. 12, 1971, abandoned. This application Mar. 27, 1974, Ser. No. 455,387

Int. Cl.² D04B 9/10; A41B 9/14

U.S. Cl. 66—14 **8 Claims**



1. A method for forming a pantyhose having two tubular leg portions and a pant portion using a circular knitting machine having two groups of needles. comprising forming the pant portion by conjoint oscillation of the two groups of needles to produce courses of stitches extending over substantially 360°; passing a yarn from one group to the other group of needles at the end of each oscillation so as to form inner and outer longitudinally split tubular layers of fabric which are joined together along their longitudinal edge portions; and forming the leg portions by continuous conjoint rotation of the two groups of needles with an independent feed to each group of needles so as to produce one leg portion within the other leg portion, the said other leg portion having a plain stitch and the said one leg portion having a purl stitch while the leg portions are disposed one within the other during formation thereof.

4,011,739

FEEDING APPARATUS FOR SHEET-LIKE MATERIALS

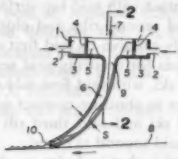
Yoshinosuke Mori; Migaku Suzuki, both of Ootake; Atsushi Kawai, Hiroshima, and Seigi Suzuki, Ootake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd.. Tokyo, Japan

Filed Sept. 24, 1975, Ser. No. 616,366

Claims priority, application Japan, Oct. 23, 1974, 49-122278

Int. Cl.² D04B 9/46

U.S. Cl. 68—181 R **10 Claims**



1. A feeding apparatus for a sheet-like material, which comprises:

a liquid supplying tank;

a downwardly extending curved slit type guide passage for the sheet-like material having a slit which is gradually decreased from an upper inlet portion thereof to a lower outlet portion;

means for supplying liquid from said liquid supply tank to both sides of said inlet portion of said guide passage for introducing said liquid stream into said slit type guide passage from along the entire width of both sides of said guide passage; and

means for rectifying said stream of liquid from said supply means upstream of said inlet portion of said guide means in such a manner that substantially no flow pattern occurs in the direction of the width of said guide passage.

4,011,740

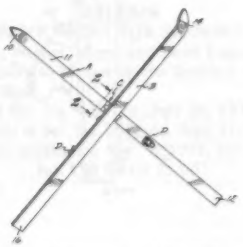
ANTI-THEFT SKI LOCK ASSEMBLY

Per A. Ljungberg, 319 Onyx Ave., Balboa Island, Calif. 92662

Filed June 7, 1976, Ser. No. 693,328

Int. Cl.² E05B 73/00

U.S. Cl. 70—58 **5 Claims**



1. In combination with a pair of skis that each have a longitudinally extending top surface to which a binding is secured at a position intermediate the ends thereof, a lock assembly for securing said pair of skis together to define a cross configuration that prevents said pair of skis being carried comfortably from a location at which they were locked together, said lock assembly including:

a. a first lock member that includes a first plate that has first and second oppositely disposed side surfaces, first and second spaced ribs that extend outwardly from said second side surface, with said first rib having a transverse opening therein, and said first and second ribs defining an elongate space therebetween;

b. a second lock member that includes a second plate that has first and second oppositely disposed side surfaces, a third rib that extends outwardly from said second side surface, with said third rib of such width and depth as to be removably insertable in said elongate space, said third rib having a transverse opening therein that may be aligned with said opening in said first rib, and a recess in said third rib that is normal to said transverse opening and in communication therewith;

c. first means for securing said first lock member to said first ski, with said first side surface of said first lock member in abutting contact with said top surface of said first ski and said first and second ribs and elongate space extending longitudinally relative to said first ski;

d. second means for securing said second lock member to said second ski, with said first side surface of said second lock member in abutting contact with said top surface of said second ski and said third rib transversely disposed relative to said second ski; and

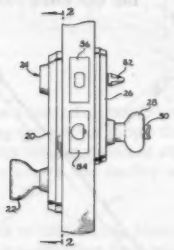
e. a lock assembly that includes an elongate lock body that slidably and snugly engages said openings in said first and third ribs when said openings are aligned, a lock pin transversely movable relative to said body and alignable with said recess, and third means for moving said pin between a projecting and retracted position, said pin when in said projecting position and in engagement with said recess holding said first and second lock members in interlocking engagement and said first and second skis in said cross configuration, and said pin when in said retracted position permitting said lock assembly to be withdrawn from said openings in said first and third ribs and said first and second skis separated.

4,011,741

LOCK CYLINDER WITH DUAL DRIVERS

Roger J. Nolin, Monterey Park, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed Apr. 6, 1976, Ser. No. 674,228
Int. Cl.² E05B *63/14*
U.S. Cl. 70—107 **14 Claims**



1. In a door latch and lock assembly having a dead bolt, apparatus for withdrawing both the latch bolt and the dead bolt upon rotation of the key comprising:

a cylinder housing containing a plurality of pins;

a plug within said cylinder housing having a front portion and a rear portion and containing a plurality of tumblers in cooperative disposition with respect to said pins, said plug having a key receiving slot on the front face thereof in cooperative disposition with respect to said tumblers;

a first drive means coupled to the rear portion of said plug, said first drive means being a lost motion drive for driving a dead bolt between latched and unlatched positions; and

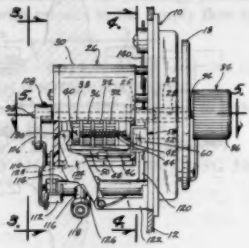
a second drive means substantially rigidly secured to the rear portion of said plug for driving a latch bolt between latched and unlatched positions.

4,011,742

LOCK DEVICE

Raymond J. Klein, North Hollywood, Calif., assignor to Dialoc Corporation of America, Denison, Iowa

Filed Aug. 4, 1975, Ser. No. 601,584
Int. Cl.² E05B *37/02*
U.S. Cl. 70—305 **4 Claims**



1. A lock device comprising

support means;

a latch bolt assembly movably mounted on said support means for movement from a closed position to an open position;

a control member movable from a locked position retentively engaging said latch bolt assembly to an unlocked position freeing said latch bolt assembly for movement to its open position;

a plurality of ratchets within said lock mechanism, said ratchets normally retentively engaging said control member and holding said control members against movement to said unlocked position, said ratchets being rotatable to a predetermined position to release said control member and permit said control member to move to said unlocked position;

spring means for yieldably urging said ratchets away from said predetermined position;

a manually operable rotating member;

pawl means movable from an initial position engaging one of said ratchets to a plurality of stepping positions engaging the remainder of said ratchets one at a time,

said rotating member being drivingly connected to said pawl means for moving said pawl means and causing rotation of the ratchet engaged by said pawl means;

a reset bar having a flange thereon engaging said ratchets for preventing rotation of said ratchets in the direction urged by the spring means, said reset bar being movable out of engagement with said ratchets for permitting said ratchets to rotate in response to said spring means;

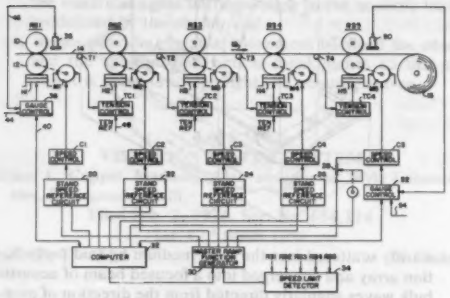
a rotatable knob operatively connected to said latch bolt assembly for causing movement of said latch bolt assembly to its open position;

reset mechanism drivingly connected to said rotatable member, said reset mechanism including a first reset member engageable with said pawl means and engageable with said reset bar, said first reset member being movable in response to rotation of said knob and opening of said latch bolt assembly to move said pawl means to its initial position and to move said reset bar out of engagement with said ratchets whereby said ratchets will rotate to their normal position retentively holding said control member against movement to said unlocked position.

4,011,743
STAND SPEED REFERENCE CIRCUIT FOR A CONTINUOUS TANDEM ROLLING MILL

Robert S. Peterson, and John W. Cook, both of Williamsville, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1976, Ser. No. 678,527
Int. Cl.² B21B *37/00, 37/14*
U.S. Cl. 72—12 **8 Claims**



1. In a continuous rolling mill, a stand speed reference circuit for supplying speed reference signals to each of a plurality of selected stands respectively comprising:

speed reference means for deriving a variable potential which is a function of the respective stand speed and for delivering said speed reference signal;

means coupled to said speed reference means for storing a voltage signal which is a function of said variable potential;

first summation means for receiving said stored voltage signal, and the instantaneous magnitude of said variable potential, and for delivering a first summation signal;

a ramp function generator means for receiving a signal (1-P.U.) multiplier during gauge change transition, the P.U. multiplier being:

$$P.U. = \frac{S(i+1)1\ H(i+1)2}{S(i)1\ H(i)2}$$

where $S(i+1)1$ = the original schedule (1) speed of the transition stand;
$S(i)1$ = the original schedule (1) speed of the stand next behind the transition stand;
$H(i+1)2$ = the new schedule (2) roll gauge for the transition ($i+1$) stand;
$H(i)2$ = the new schedule (2) roll gauge for the ith stand;

and for delivering a voltage which is a function of the incremental desired change in speed for all stands being then changed;

multiplying means connected to receive and multiply said stored voltage and said incremental desired change voltage, and for delivering a product voltage;

a second summation means connected to receive said first summation signal and said product voltage, and for delivering an error signal;

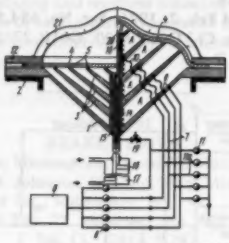
control means connected to receive a first schedule stand speed reference signal and said error signal, and for delivering a control signal to said speed reference means, the magnitude of said variable potential being successively a function of said first schedule stand reference signal and said error signal respectively;

means for controllably interrupting the connection of said first schedule stand reference signal, and said error signal to said control means, and for controllably decoupling said storing means from said variable potential, the stored voltage upon decoupling being the input to said first summation means, so that said error signal is applied to said control means only when the discrete stand speed is to be changed upon making a gauge change in the first rolling schedule.

4,011,744
METHOD AND MEANS FOR SHAPING PARTS BY HYDRAULIC EXTRUSION

Vladislav, Ivanovich Ershov, ulitsa Volgina, 19, kv. 16, and Nikolai Dmitrievich Livenko, ulitsa Profsojuznaya, 100, korpus 4, kv. 198, both of, Moscow, U.S.S.R.

Division of Ser. No. 408,004, Oct. 19, 1973, Pat. No. 3,910,086. This application Feb. 25, 1975, Ser. No. 552,780
Claims priority, application U.S.S.R., Mar. 30, 1973, 1902339; July 5, 1973, 1931501
Int. Cl.² B21D *26/04*
U.S. Cl. 72—57 **1 Claim**

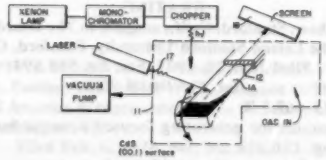


1. A method for shaping parts by hydraulic extrusion, comprising the steps of: profiling a sheet metal workpiece by liquid simultaneously supplied to different zones of said workpiece at different pressure values corresponding to the shape of said workpiece, said workpiece having a central part and a flange section, said liquid comprising a variable-pressure deforming agent, the variable liquid pressure increasing the wall thickness in the central part of said workpiece and decreasing the wall thickness in the flange section of the workpiece the elasticity of the workpiece remaining substantially unchanged by said liquid.

4,011,745
SEMICONDUCTOR SENSORS

Harry C. Gatos, Weston, Mass., and Jacek Lagowski, Warsaw, Poland, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 492,118, July 26, 1974, abandoned, which is a division of Ser. No. 290,666, Sept. 21, 1972, Pat. No. 3,887,937. This application Nov. 7, 1975, Ser. No. 629,839
Int. Cl.² G01N *23/00*
U.S. Cl. 73—23 **11 Claims**



1. A gas sensor comprising:

a. a semiconductor wafer formed of a non-centrosymmetric

material having a high energy gap and selected from the group consisting of materials having wurtzite and zinc-blende structure;

b. a vacuum chamber containing the wafer and adapted to receive traces of a gas that introduces surface states in the wafer through absorption;

c. a source of illumination whose energy corresponds to the energy of the introduced surface states, said source illuminating the wafer for causing the latter to deflect an amount dependent on the wavelength of the illumination; and

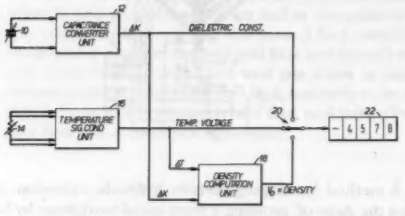
d. means for measuring the deflection of the wafer for detecting the presence of said gas in the chamber.

4,011,746

LIQUID DENSITY MEASUREMENT SYSTEM

Paul G. Weitz, Jr., Salisbury, and David A. Lamphere, Milton, both of Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,584
Int. Cl.² G01N 9/00; G01R 27/26
U.S. Cl. 73—32 R **11 Claims**



1. A liquid density measurement system, comprising:

a capacitance probe mounted for immersion in a mass of liquid the density of which is to be measured, the capacitance of the probe being dependent on the dielectric constant of the liquid;

a capacitance converter unit connected to the probe and arranged to produce a first signal the magnitude of which is dependent on the dielectric constant of the liquid;

temperature sensing means mounted for immersion in the liquid and responsive to variations in temperature thereof;

a temperature signal conditioning unit connected to the temperature sensing means and arranged to produce a second signal the magnitude of which is dependent on the temperature of the liquid; and

a density computation unit connected to receive and individually scale said first and second signals, the computation unit including summing means arranged to sum the scaled first and second signals to produce an output signal proportional to the density of the liquid.

4,011,747

METHOD AND APPARATUS FOR ACOUSTIC SCANNING USING WAVES SCATTERED BY AN ACOUSTIC GRATING

H. John Shaw, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford University, Stanford, Calif.

Filed June 20, 1975, Ser. No. 588,694
Int. Cl.² H03H 9/26
U.S. Cl. 73—67.5 R **50 Claims**

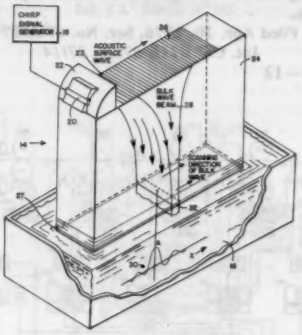
1. Apparatus for generating focused acoustic bulk waves, comprising:

a. means for generating a chirp pulse output;

b. a solid medium for transmitting acoustic waves;

c. an array of perturbations located on one surface of the solid medium; and

d. transducer means operatively connected to the generating means and the solid medium for converting the chirp pulse from the generating means into surface acoustic waves propagating along the perturbation array surface of the solid medium, said surface acoustic waves being in-



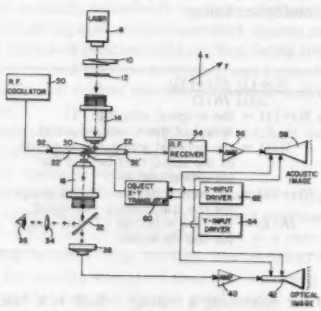
wardly scattered into the solid medium by said perturbation array and converged into a focused beam of acoustic bulk waves angularly directed from the direction of propagation of the surface acoustic waves.

4,011,748

METHOD AND APPARATUS FOR ACOUSTIC AND OPTICAL SCANNING OF AN OBJECT

Walter L. Bond, Los Altos, Calif.; Rudolf Kompfner, Oxford, England, and Ross A. Lemons, Mountain View, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Sept. 18, 1975, Ser. No. 614,440
Int. Cl.² G01N 29/04
U.S. Cl. 73—67.6 **33 Claims**



1. A microscope for scanning an object with light and acoustic waves, comprising:

a. optical lens means for focusing light on an object located at the optical focal plane of said lens so that the light passes through the object and is modulated thereby;

b. photodectector means for converting the modulated light into a corresponding electrical signal;

c. optical lens means located between the optical focal plane and the photodetector means for receiving the light modulated by the object and directing the light onto the photodetector means;

d. means connected to the photodetector means for recording the electrical signal corresponding to the light modulated by the object;

e. means for generating acoustic waves;

f. means connected to the acoustic wave generating means for propagating the acoustic waves therefrom;

g. acoustic lens means connected to the acoustic wave

propagating means for focusing the acoustic waves on the object located at the acoustic focal plane of said lens so that the acoustive waves pass through the object and are modulated thereby;

h. transducer means for converting the modulated acoustic waves into a corresponding electrical signal;

i. means located between the acoustic focal plane and the transducer means for propagating the acoustic waves modulated by the object to the transducer means;

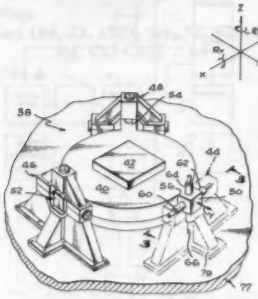
j. means connected to the transducer means for recording the electrical signal corresponding to the acoustic waves modulated by the object; and

k. means providing relative movement between the object and the acoustic and optical focal planes so that the object is scanned by the light and acoustic waves.

4,011,749
VIBRATION TESTING SYSTEM

Klaus L. Cappel, Madison, Ala., assignor to Wyle Laboratories, El Segundo, Calif.

Filed Feb. 2, 1976, Ser. No. 654,114
Int. Cl.² B06B *1/00*
U.S. Cl. 73—71.6 **14 Claims**



1. Apparatus for moving a load, comprising:

a table having an actuator-movable portion with opposite sides; and

hydraulic moving means for moving said table, including a pair of hydraulic actuators having bearing means bearing against the opposite sides of said actuator-movable table portion;

each of said hydraulic actuators being constructed to move its bearing means parallel to an imaginary X axis; and

each of said bearing means slideably bearing against a corresponding side of said table portion, to permit slideable movement of said table portion in a direction along an imaginary Z axis which is perpendicular to said imaginary X axis.

4,011,750
METHOD AND APPARATUS FOR ULTRASONIC EXAMINATION OF OBJECTS

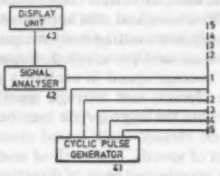
David Errol Robinson, Avalon Beach, Australia, assignor to The Commonwealth of Australia care of the Secretary Department of Health, Australian Capitol Territory, Australia

Continuation-in-part of Ser. No. 367,628, June 6, 1973, abandoned. This application June 30, 1975, Ser. No. 591,311
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.7 **18 Claims**

9. A method of ultrasonic examination of an object comprising the steps of transmitting pulses of ultrasonic energy into the object and receiving echoes of said pulses of ultrasonic energy reflected by acoustic impedance discontinuities within the object, wherein:

said pulses are transmitted along a single axis by a central transducer and by a plurality of annular transducers positioned concentrically with said axis of the central transducer, and

echoes of pulses transmitted into the object by each of said central transducer and said annular transducers reflected along said single axis are received by said central transducer,

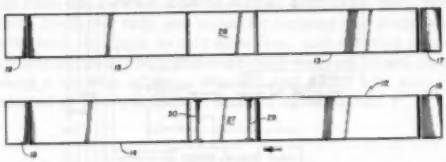


said method including separately storing and then subsequently analyzing said received echoes of pulses transmitted by each of said central transducer and said annular transducers to extract velocity, scattering and multiple reflection information.

4,011,751
BRAKE TESTER

Arnold A. Weiss, Minneapolis; Daniel M. Motl, New Brighton, and Eugene D. Johnston, St. Paul, all of Minn., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Feb. 27, 1976, Ser. No. 662,018
Int. Cl.² G01L *5/28*
U.S. Cl. 73—122 **10 Claims**



6. Vehicle brake testing apparatus comprising:

two pairs of tread plates upon which wheels of the vehicle are to be driven and stopped by braking, there being one pair of tread plates for the front wheels and one for the rear wheels,

means for mounting each tread plate for longitudinal movement independently of the other tread plates,

means connected to each tread plate for producing an analog electrical braking signal dependent in value upon the braking force on the wheel engaging the tread plate,

means for converting the analog signals to corresponding digital signals,

digital computing means for computing the values of various relations between the values of the various digital signals corresponding to said analog signals,

and digital display means having electronic display elements and means selectively energizing said display elements to indicate digitally the values of said various relations.

4,011,752
ADAPTIVE SPEED AND DIRECTION ANALYZER

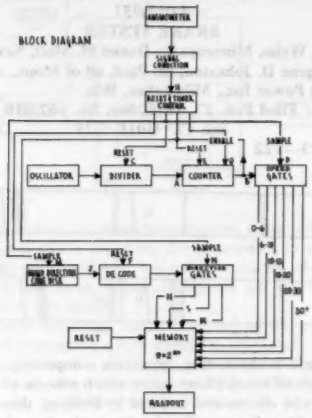
William B. Fowler, Wenatchee, Wash., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 6, 1976, Ser. No. 656,032
Int. Cl.² G01W *1/02*
U.S. Cl. 73—189 **1 Claim**

1. An apparatus capable, at a selected location and employing a preselected distance increment of fluid travel as a basis, of cumulatively and continuously measuring, storing, and

indicating the average speed during and the direction existent at the end of each of said measured increments of fluid travel, said average speed being measured and indicated within the appropriate member of a plurality of preselected speed classes, each speed class encompassing a preselected span of speeds, and said direction being measured and indicated within the appropriate member of a plurality of preselected direction classes, each direction class encompassing a preselected span of directions, and said apparatus in addition capable of cumulatively and continuously measuring, storing, and indicating, based on said preselected distance increments of fluid travel, the average speed in each of a plurality of preselected direction classes, said average speed being measured and indicated within the appropriate member of a plurality of preselected speed classes, each speed class encompassing a preselected span of speeds, and each of said direction classes encompassing a preselected span of directions, said apparatus comprised of the following components together with associated circuitry, each component recited as means plus function:

1. fluid motion sensing means adapted to accept as mechanical input, the movement of an ambient fluid over a preselected distance increment of fluid travel and to generate from said input of fluid motion electronic output signals related to the speed of the moving fluid, said sensing



means additionally adapted to respond to changes of direction of the fluid in motion, accept the changes of direction as input and mechanically operate circuit switches to implement selection of the appropriate member of a plurality of preselected direction classes corresponding to the direction of the moving fluid;

2. means for signal conditioning adapted to accept the electrical output of the sensing means and condition this output to a form suitable for use with the following apparatus components;
3. reset and timer control means adapted to receive as input the signal from the signal conditioning means and to generate output signals coordinating and actuating operations of the velocity and direction monitoring components of the apparatus as follows;
4. a first preselected plurality of electronic gates and gate selection means adapted to separate and accept severally the fluid velocity-related output signals of the reset and timer control means for a numerically equivalent plurality of preselected velocity classes;
5. a second preselected plurality of electronic gates and gate selection means adapted to separate and accept severally the fluid direction-related output signals of the reset and timer control means for a numerically equivalent plurality of preselected directional sectors;
6. electronic memory means adapted to accumulate and store the output signals generated by means of (1) adapted by means (2), coordinated by means (3) and segregated by means (4) and means (5);
7. data display means adapted to convert the stored signals of memory means (6) above to readout.

4,011,753

METHOD AND DEVICE FOR MEASURING THE FLOW VELOCITY OF MEDIA BY MEANS OF ULTRASOUND

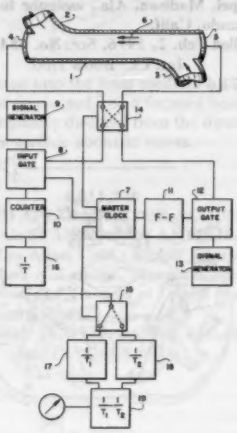
Eberhard Hausler, Saarbrucken, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed June 26, 1975, Ser. No. 590,631

Claims priority, application Germany, June 29, 1974, 2431346

Int. Cl.² G01F 1/66

U.S. Cl. 73—194 A **11 Claims**



1. In a method of measuring the flow velocity of media in conduits by means of ultrasound, with the ultrasonic waves being produced by electric signals at one end of a measuring section, transmitted through the measuring section, and retransformed into electric signals at the other end, the improvement comprising determining the transit time T_1 of the ultrasound in the flow direction and the transit time T_2 of the ultrasound in the opposite direction; digitizing the two transit times T_1 and T_2; inverting the digitized values into their respective reciprocal values $1/T_1$ and $1/T_2$; establishing the difference $1/T_1 - 1/T_2$ between the two reciprocal values; and determining the flow velocity $v = s/2\ (1/T_1 - 1/T_2)$ from such difference, where v is the flow velocity of the media and s is the length of the measuring section.

4,011,754

FLOWMETER

Gillies D. Pitt, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

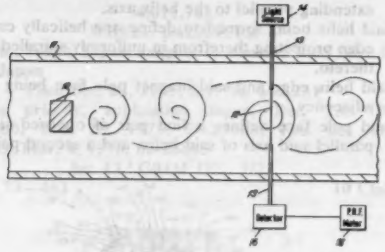
Filed June 7, 1976, Ser. No. 693,526

Int. Cl.² G01F 1/32

U.S. Cl. 73—194 VS **11 Claims**

1. A flowmeter comprising: a conduit section for providing a fluid flow path; a body fixed relative to said conduit section inside thereof in a position and being constructed to cause vortex shedding in a fluid flowing in a predetermined direction in said conduit section; an optical fiber supported inside said conduit section downstream of said body in a position such that light passing therethrough is modulated by vortices cre-

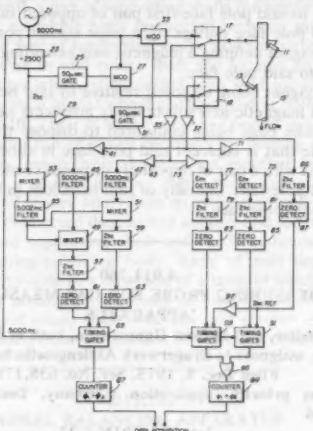
ated by said body, said fiber having a refractive index somewhat greater than that of said fluid; and sensor means connected from said fiber to sense changes in the illumination transmitted thereby.



4,011,755
ACOUSTIC FLOWMETER

Norman E. Pedersen, Wilmington, and James E. Bradshaw, Tyngsboro, both of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Filed Oct. 23, 1975, Ser. No. 625,170
Int. Cl.² G01F 1/66
U.S. Cl. 73—194 A **8 Claims**



1. Acoustic flowmeter apparatus comprising:

a pair of acoustic transducers located at upstream and downstream positions respectively relative to a conduit in which flow velocity is to be measured;

signal generating, modulating and switching means interconnected with said transducers for transmitting a modulated signal from one transducer to the other, alternately upstream and downstream, the signal transmitted in each direction comprising a gated burst of a measurement frequency, repeated periodically, the received signal at the then non-transmitting transducer being a delayed version of the transmitted signal, the delay being variable as a function of the flow velocity;

narrow band filter means for extracting the measurement frequency component from the downstream received modulated signal to provide a first continuous sine-wave signal;

narrow band filter means for extracting the measurement frequency component from the upstream received modulated signal to provide a second continuous sine-wave signal; and

timing means for measuring the difference in phase directly between said first and second continuous sine-wave signals, the flow velocity being proportional to said measurement.

4,011,756
METALLIC HOT WIRE ANEMOMETER

Fred R. Lemos, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

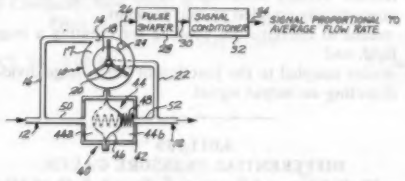
Filed Sept. 5, 1975, Ser. No. 610,802
Int. Cl.² G01F 1/68
U.S. Cl. 73—204 **9 Claims**

1. A hot wire anemometer for measuring air flow along a path comprising a metallic body, said body defining a narrow edge face and tapering surfaces diverging rearward from said edge face, said body defining first and second cylindric holes terminating at their outer ends at spaced apart locations in said edge face and at their other ends at a portion of the body remote from said edge face, first and second electrical conductor rods disposed in respective said holes and having distal ends accessible from said edge face, means circumscribing said conductor rods for electrically insulating said conductor rods from one another, a probe wire secured to the distal ends of said conductor rods, and means for securing said probe wire throughout its length to said edge face, said securing means partially circumscribing said wire, said securing means comprising a ceramic adhesive whereby said probe wire may be operated at a temperature at least as high as 1,300° F.

4,011,757
DEVICE FOR BYPASSING FLOW RATE PULSATIONS AROUND A FLOW RATE TRANSDUCER

Wilfried Baatz, Bellevue, Wash., assignor to FloScan Instrument Company, Inc., Seattle, Wash.

Filed May 14, 1975, Ser. No. 577,188
Int. Cl.² G01F 1/06, 15/02
U.S. Cl. 73—229 **18 Claims**



1. A device for use with a flow rate transducer means, said transducer means for measuring flow rate through a conduit, said flow rate transducer means having a fluid inlet and a fluid outlet and being capable of providing a signal indicative of flow rate therethrough, said device for bypassing flow rate pulsations occurring in said conduit around said transducer at low flow rates, said device comprising:

a housing defining a fluid chamber, said chamber having a wall and an axis,

a flexible diaphragm means mounted in said chamber and being oriented transversely to said axis, said diaphragm having a central portion intersected by said axis, said

diaphragm means having a periphery affixed to said housing in fluid sealing relationship so as to divide said chamber into a first compartment and a second compartment, said diaphragm means being movable between at least a first position and a second position, said diaphragm means being biased toward said first position and away from said second position,

first means associated with said housing for placing said first compartment in fluid communication with the inlet to said fluid transducer, said first means including an inlet conduit means in said housing defining a fluid inlet to the first compartment of said chamber, the central portion of said diaphragm means in said first position lying adjacent said fluid inlet, said fluid inlet lying on said axis and being positioned in said housing so as to inject a fluid jet into said chamber substantially along said axis and to direct said fluid jet to impinge upon the central portion of said diaphragm means, said diaphragm means in said second position being flexed away from said first position toward said second compartment of said chamber responsive to fluid flow into said first compartment, and

second means associated with said housing for placing said second compartment in fluid communication with the outlet from said transducer.

4,011,758

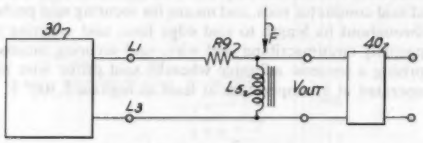
MAGNETOSTRICTIVE PRESSURE TRANSDUCER

Arthur L. Reenstra, Attleboro, Mass., and George Trenkler, East Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 428,485, Dec. 26, 1973, abandoned. This application Oct. 17, 1975, Ser. No. 623,867

Int. Cl.² G01L *19/04*

U.S. Cl. 73—393 **11 Claims**



1. A system for measuring pressure comprising:

a. means including an element responsive to the application of a force thereto for causing a change in magnetic inductance of the element proportional to said force;

b. force directing means for directing said force applied to the element along a single axis of the element;

c. a voltage divider comprising a temperature responsive resistor serially connected to a winding, the winding magnetically coupled to said element;

d. means to energize the winding for creating a magnetic field; and

e. means coupled to the junction of the voltage divider for detecting an output signal.

4,011,759

DIFFERENTIAL PRESSURE GAUGE

James W. Phillips, and Terrence J. Troyer, both of Michigan City, Ind., assignors to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Dec. 11, 1975, Ser. No. 639,969

Int. Cl.² G01L *7/08*

U.S. Cl. 73—407 R **16 Claims**

1. In a gauge that includes linear to rotary motion transforming means including a helix journaled for rotation about its longitudinal axis, with the helix having an indicator connected thereto, a magnet for producing rotational movement of said helix about its said axis in response to linear movement of the magnet alongside and lengthwise of said helix axis, and a housing for the helix and magnet,

the improvement wherein:

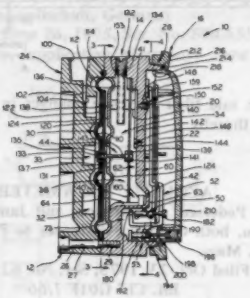
said magnet has a planar face of quadrilateral configuration,

with said magnet being disposed to position said pole face thereof facing the helix, with the plane of the pole face extending parallel to the helix axis,

said helix being formed to define one helically contoured edge projecting therefrom in uniformly spiralled relation thereto,

said helix edge and said magnet pole face being in close adjacency,

said pole face defines a first pair of opposed sides that parallel said axis of said helix, and a second pair of opposed sides that are respectively normally disposed relative to said pole face first pair of opposed sides, whereby said pole face defines right angle corner portions,



said magnet defining a magnetic axis extending perpendicular to said pole face,

said magnet being disposed relative to said helix such that said magnetic axis substantially intersects said helix axis,

said helix edge being contoured to dispose the portion of same that is adjacent said pole face in substantial alignment with a pair of oppositely disposed corner portions of said pole face, laterally of said helix axis in the direction of said pole face.

4,011,760

MEASURING PROBE FOR GAS MEASURING APPARATUS

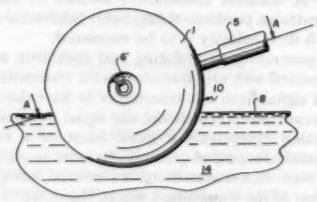
Dieter Heller, and Helmut Hannemann, both of Lubeck, Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Filed Dec. 5, 1975, Ser. No. 638,171

Claims priority, application Germany, Dec. 18, 1974, 2459826

Int. Cl.² G01N *1/22*

U.S. Cl. 73—421.5 R **4 Claims**



1. A measuring probe for gas measuring apparatus, comprising a probe head, a probe line for conveying the measured gas to the gas measuring apparatus connected into said probe head, said probe head comprising a float having at least one intake opening for the measured gas, and a connecting passage connected between the opening and said probe line, a pipe located within said probe head, said probe head being a foamed plastic material, said pipe defining the passage con-

nected between the opening and said probe line, said pipe comprising a T-shape piece.

4,011,761
WHEEL BALANCER

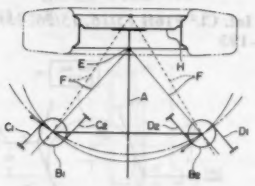
Jinichi Ito, Tokyo, Japan, assignor to Yamada Yuki Seizo Co., Ltd., Japan

Filed Dec. 22, 1975, Ser. No. 643,251

Claims priority, application Japan, Dec. 23, 1974, 49-147880; Feb. 28, 1975, 50-25408; Feb. 28, 1975, 50-25409; Mar. 4, 1975, 50-26883

Int. Cl.² G01M *1/02, 1/22*

U.S. Cl. 73—462 **10 Claims**



1. A wheel balancer comprising a wheel having an amount of unbalance to be measured, a base, a rotary shaft for rotatably mounting said wheel thereon, an instantaneous center of vibration of said wheel being movable along a center axis of said rotary shaft, a pair of supporting shafts for supporting said rotary shaft, a rocking body connected between said rotary shaft and said pair of supporting shafts, said supporting shafts being transverse to said rotary shaft and located on a circle having a center which is coincided with said instantaneous center of vibration of said wheel and arranged at both sides of said rotary shaft, a pair of spring-receiving bodies mounted on said base, and a pair of spring members for holding said supporting shafts, respectively, each spring member being disposed within a spring-receiving body, each spring member having one end spaced apart from its associated said supporting shaft and connected thereto and another end secured to its associated said supporting shaft and made stationary to its associated spring-receiving body, each of said supporting shafts being movable in a direction of a tangent touching said circle as said instantaneous center of vibration moves along said axis of said rotary shaft, whereby said amount of unbalance is measured from the amount of vibration of said wheel.

4,011,762
WHEEL BALANCING APPARATUS

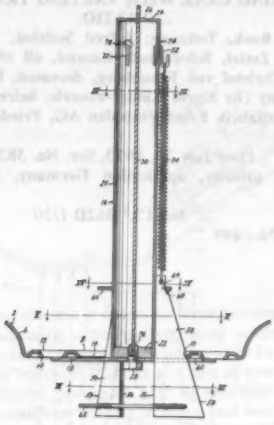
Richard S. Kubik, 1030 Villa Vista Drive, Colby, Kans. 67701

Filed Dec. 8, 1975, Ser. No. 638,664

Int. Cl.² G01M *1/02, 1/12*

U.S. Cl. 73—484 **1 Claim**

1. In a wheel balancing device for automotive wheels:
   a. a planar support plate adapted to be placed beneath the central disc of a wheel in overlying relation to the central hub aperture of said wheel to support said wheel in a generally horizontal plane,
   b. a rigid tube affixed at its lower end to said support plate concentrically therewith and extending upwardly therefrom accurately at right angles to the plane thereof,
   c. a generally vertical flexible cable,
   d. attaching means connecting the lower end of said cable to said support plate such that the lowermost flexure joint of said cable is disposed at least slightly above the center of gravity of a wheel carried on said support plate, said cable extending upwardly through and above said tube,
   e. centering means operable to center said wheel concentrically with said tube and the lower end of said cable, said centering means comprising an upwardly tapering, generally conical assembly carried by said support plate and consisting of a plurality of planar blades disposed in planes radial to said tube and spaced regularly thereabout, said blades projecting slidably through notches formed radially in said support plate, whereby said assembly may be moved slidably in a direction parallel to said tube, the inner edges of said blades resting in sliding engagement with said tube, and the outer edges of said blades sloping downwardly and outwardly, connecting means rigidly joining said blades together beneath the level of said support plate, and resilient means biasing said conical assembly yieldably upwardly relative to said support plate, whereby to adjust the circle defined by the



outer edges of said blades at the upper surface of said support plate to the diameter of the central hub aperture of said wheel, said resilient means biasing said conical assembly upwardly comprising a plurality of tension springs each connected at its lower end to the upper end of one of said blades, and at its upper end to said tube,
   f. a gauge member carried rigidly by said tube at the upper end thereof and having an aperture formed therein accurately concentric with said tube, said cable extending upwardly through said aperture, and
   g. means for suspending said cable from its upper end to support said wheel.

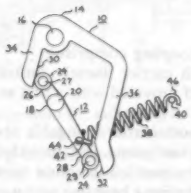
4,011,763
SHAFT TURNING MECHANISM

Andrew H. Caldwell, Roanoke, Va., assignor to General Electric Company, New York, N.Y.

Filed June 13, 1975, Ser. No. 586,770

Int. Cl.² F16H *21/44*

U.S. Cl. 74—100 R **3 Claims**



1. A linkage arrangement for converting rotation of a first shaft in either of two directions into unilateral rotation of a second shaft comprising:
   a. a substantially u-shaped member attached at a bight thereof to said first shaft adapted to be rotated in either of two directions;

b. an elongated link attached at an intermediate point thereof to said second shaft, said linkage being engageable at the ends thereof with inner surfaces of opposing legs of said u-shaped member whereby bilateral rotation of said first shaft effects a unilateral rotation of said second shaft; and

c. biasing means connected to said link for urging the ends thereof into contact with said legs of said u-shaped member.

4,011,764

STEERING GEAR WITH VARYING TRANSMISSION RATIO

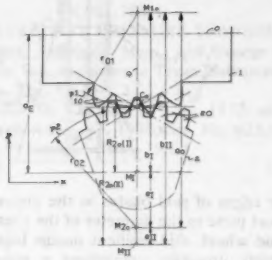
Günther Buck, Tettnang; Alfred Seifried, Friedrichshafen; Albert Zettler, Schwabisch Gmund, all of Germany, and Hans-Christof von Fraunberg, deceased, late of Iggingen, Germany (by Sigrid Köhler-Feuerle, heiress), assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

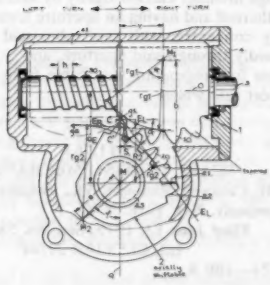
Filed July 30, 1973, Ser. No. 383,495

Claims priority, application Germany, July 29, 1972, 2237421

Int. Cl.² B62D *1/20*

U.S. Cl. 74—499 **6 Claims**





1. A gear coupling comprisng:

a first tooth carrier linearly shiftable in a predetermined plane and provided with a first set of identically profiled involute teeth; and

a second tooth carrier swingable about a pivotal axis transverse to said plane and provided with a second set of identically profiled involute teeth, each of said tooth carriers having a base line with a constant radius of curvature in said plane, at least one of said radii being of finite magnitude, said first and second sets of teeth meshing with each throughout a range of displacement between two limiting positions flanking a midposition in which the centers of curvature of the base lines of said first and second sets of teeth are offset from said pivotal axis on a line perpendicular to the direction of shift of said first tooth carrier, said first and second sets of teeth engaging each other with clearances which are substantially zero in said midposition but which progressively increase toward said limiting positions and with a transmission ratio varying substantially monotonically between said midposition and each of said limiting positions.

4,011,765

BALL AND CONE FRICTION TRANSMISSION WITH OPTIMALLY ADAPTED CONE ANGLE

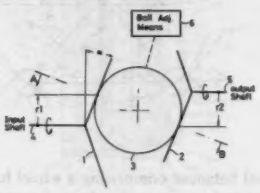
Heinrich Tippmann, Munich, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed July 23, 1975, Ser. No. 598,211

Claims priority, application Germany, Aug. 1, 1974, 2437174

Int. Cl.² F16H *15/16, 15/26, 15/08*

U.S. Cl. 74—193 **3 Claims**



1. A friction type, variable-ratio mechanical transmission having a pair of rotationally-mounted, concave members generally facing each other with a laterally adjustable rotational member therebetween and in frictional contact with said concave members, comprising:

means defining a conical surface on each of said concave members, each of said conical surfaces having an apex;

and a rotatable shaft joined to each of said concave members at said apex thereof, said shafts extending axially in spaced mutually parallel relationship oppositely from the direction of concavity of the corresponding conical surface to provide said concave member rotational mounting;

the angle made between each of said conical surfaces and a line normal to the corresponding shaft being not less than 18° nor more than 28°.

4,011,766

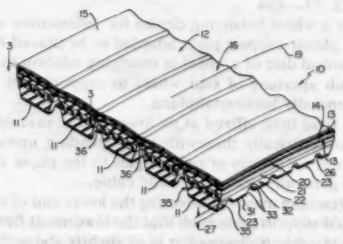
ENDLESS POWER TRANSMISSION BELT

Dale L. Waugh, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 19, 1976, Ser. No. 659,312

Int. Cl.² F16G *5/00, 1/22, 5/10*

U.S. Cl. 74—234 **20 Claims**



1. An endless power transmission belt for operation in an endless path comprising a plurality of laterally spaced belt elements and a tie band interconnecting said belt elements, each of said elements comprising, a tension section, a load-carrying section, and a compression section, each of said

elements having a plurality of teeth defined in its compression section, said teeth in each belt element being staggered relative to teeth of an immediately adjacent belt element, said teeth providing optimum flexibility for said belt characterized by a substantially uniform bending modulus, said staggered relation of the teeth assuring the belt is free of hinge points and also assuring quieter operation thereof in associated sheaves.

4,011,767

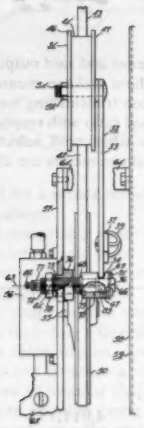
AXIALLY ADJUSTABLE MOUNTING FOR A BELT IDLER

John P. Nelson, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 9, 1976, Ser. No. 656,332

Int. Cl.² F16H *7/10*

U.S. Cl. 74—242.15 R **11 Claims**



1. An adjustable mounting arrangement permitting axial adjustment of the position of belt idler means, comprising:

a support having an internally threaded opening therethrough,

a support shaft having

an externally threaded portion in cooperative threaded engagement with said threaded opening with a part thereof extending beyond one side of said support,

a wrench receiving portion on the end of said support shaft extending beyond said one side of said support,

a bearing portion on the opposite end of said support shaft and disposed on the other side of said support,

belt idler means supported on said bearing portion for relative movement about the axis thereof, and

lock means engageable with said shaft and support for selectively locking said support shaft in selected positions of threaded adjustment relative to said support.

4,011,768

PUMP SWASH PLATE CONTROL LINKAGE

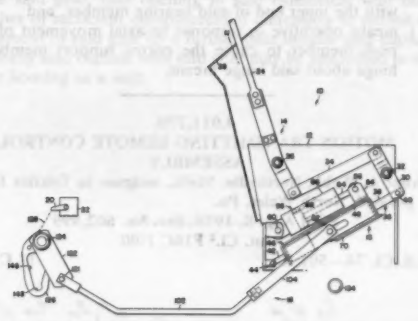
Dean James Tessenske, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Apr. 16, 1975, Ser. No. 568,703

Int. Cl.² G05G *11/00*

U.S. Cl. 74—479 **5 Claims**

1. For use in controlling an adjustable swash plate of a variable displacement hydraulic drive pump of a hydrostatic transmission, a manual control linkage comprising: a manually shiftable input linkage means; an output linkage means adapted for connection to said adjustable swash plate; a motion-moderating means connecting said input linkage means to said output linkage means for transferring the motion of said input linkage means to said output linkage means at a preselected maximum rate of speed regardless of the rate of speed that motion is manually imparted to said input linkage means; and said motion-moderating means including a motion-transferring member mounted for movement in opposite first and second directions; dash pot means connected to said motion-transferring member for regulating the rate of speed of the movement of the member such that said preselected maximum rate of speed is not exceeded; first connecting means connecting said input linkage means to said motion-transferring member and including resilient means normally in a



self-restored state wherein it exerts no force tending to move said motion-transferring member, but being selectively deflectable in opposite directions by said input linkage means when the latter is operated to move at a rate of speed greater than said preselected maximum rate to establish first and second loaded conditions tending to move said motion-transferring member in its said opposite first and second directions; and second connecting means connecting said output linkage means to said motion-transferring member for movement with the latter.

4,011,769

VEHICLE REAR-VIEW MIRROR MOUNTING ARRANGEMENT

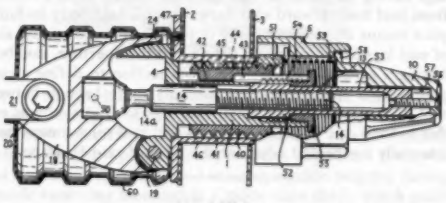
Kenneth Paul Davis, Harlington, England, assignor to Magnatex Limited, Middlesex, England

Filed Oct. 28, 1975, Ser. No. 626,125

Claims priority, application United Kingdom, July 23, 1975, 31285/75

Int. Cl.² F16D *11/00*; A47G *1/24*

U.S. Cl. 74—479 **8 Claims**



1. A mounting arrangement for mounting a vehicle rearview mirror on the outside of a part of a vehicle body, comprising:

a. a tubular bearing member adapted to be mounted to extend through and be turnable in the body part and having an outer and an inner end and defining a passage extending therethrough,

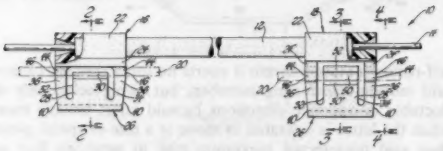
b. a mirror support member,

c. hinge means having an axis extending transversely to the axis of said bearing member and hinging said mirror support member to the outer end of said bearing member for hinging about the axis of the hinge means,

d. a first rotatable control member connected to the inner end of the bearing member for turning the bearing member about its axis,
e. a reduction drive connecting said first control member to said bearing member,
f. a push member axially movable in the passage in said bearing member,
g. a second rotatable control member,
h. screw-thread means coupling the inner end of said push member to said second control member,
i. means holding said second control member axially captive with the inner end of said bearing member, and
j. means operative in response to axial movement of said push member to cause the mirror support member to hinge about said hinge means.

4,011,770
MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

Grant A. Webb, Northville, Mich., assignor to Teleflex Incorporated, North Wales, Pa.

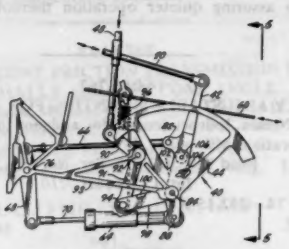
Filed Aug. 8, 1975, Ser. No. 602,999
Int. Cl.² F16C *1/00*
U.S. Cl. 74—501 R **11 Claims**

1. A motion transmitting remote control assembly of the type for transmitting motion in a curved path by a flexible motion transmitting core element, said assembly comprising: guide means; a flexible motion transmitting core element movably supported by said guide means; a support fitting for disposition in an aperture and attached to one of said guide means and said core element, said support fitting including flange means for engaging the wall at one extremity of the aperture to prevent the fitting from moving through the aperture as it is inserted therein, a body extending from said flange means, a pair of spaced flexible legs extending from said body generally toward said flange means in a cantilevered fashion and defining shoulders disposed in spaced relationship to said flange means for moving through the aperture as said fitting is inserted therein and to engage the wall at the opposite extremity of the aperture for retaining the fitting therein, each of said legs having first and second laterally spaced sides extending from said body toward said flange means, said body including pilot means disposed laterally outwardly of each of said sides of said legs for guiding said fitting into the aperture, said body having a generally U shape in cross section to define a completely void space extending laterally therethrough between said pilot means and between said legs so that said legs may flex toward one another, said legs and said pilot means being integrally connected adjacent the base of said U shape.

4,011,771
STEERING RANGE SELECTOR

Charles V. Harris, Cerritos; Lowell F. Pickett, Los Alamitos, and George A. Schlanert, Tustin, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 16, 1975, Ser. No. 622,955
Int. Cl.² G05G *7/04;* **B64C** *25/50*
U.S. Cl. 74—522 **19 Claims**

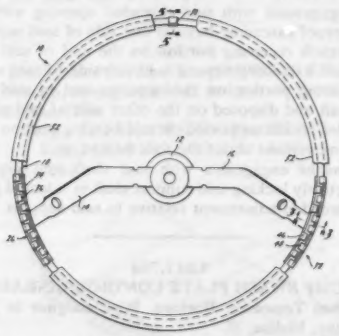
1. In a control system for a steerable wheel on an aircraft, selectable means for changing the ratio of inputs thereto to outputs therefrom, said means including:
input motion receiving means;
output motion transmitting means;
selectably engageable and disengageable linkage means to restrain said output motion transmitting means to move at a first predetermined ratio with respect to said input motion receiving means; and
resilient linkage means connected between said input motion receiving means and said output motion transmitting means, said resilient linkage means being sized to urge said output motion transmitting means to move at a second predetermined ratio with respect to said input motion receiving means when said selectably engageable and disengageable linkage means are disengaged.



4,011,772
STEERING WHEEL FOR A MOTOR VEHICLE

George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,642
Int. Cl.² B62D *1/04;* **G05G** *1/10*
U.S. Cl. 74—552 **9 Claims**

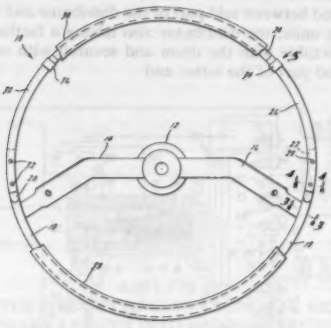


1. A steering wheel for a motor vehicle having a hub, a spoke attached to said hub and a rim core assembly attached to said spoke;
said rim core assembly comprising a plurality of leaf spring members;
each of said leaf spring members having a circular shape in the plan view;
said rim core assembly being resiliently deformable in response to an impact load imposed upon said assembly in a direction parallel to the axis of said steering wheel.

4,011,773
STEERING WHEEL

George H. Muller, Ann Arbor, and Warren A. VanWicklin, Jr., Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,643
Int. Cl.² B62D 1/04; G05G 1/10
U.S. Cl. 74—552 15 Claims



1. A steering wheel for a motor vehicle having a rim means with a flexible rim portion;

said steering wheel comprising a hub and a spoke having its inner end connected to said hub;

said rim means being secured to the outer end of said spoke;

said rim means comprising a rigid rim core member of generally arcuate shape in plan view;

said rim means also including a flexible rim core member of generally arcuate shape in plan view secured to said rigid rim core member and combining with said rigid member to form a structure of annular shape;

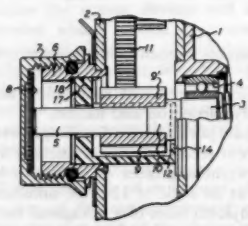
said flexible rim core member being deflectable under an impact load imposed upon the mid point of said flexible member in a direction parallel to the axis of rotation of said wheel;

said rigid rim core member being substantially rigid with respect to an impact load imposed upon the mid point of said rigid member that is equal in magnitude and parallel in direction to said first mentioned impact load.

4,011,774
GEAR WHEEL CASING

Börje Sigurd Moosberg, Morrum, Sweden, assignor to Abu Aktiebolag, Svangsta, Sweden

Filed Nov. 3, 1975, Ser. No. 628,396
Claims priority, application Sweden, Nov. 13, 1974, 7414235
Int. Cl.² F16H 57/02; A01K 89/00
U.S. Cl. 74—606 R 4 Claims

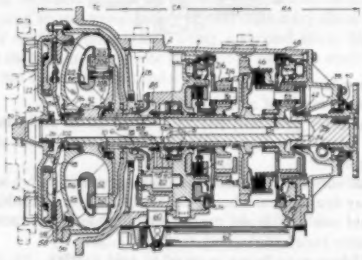


1. In a device, such as a fishing reel, having a gear housing, the combination in said housing of a gear casing and a gear, said gear casing being formed as a capsule comprising a cylindrical wall having an opening formed therein so that said wall is C-shaped in cross-section, the inner radius of curvature of said cylindrical wall being slightly more than the outer radius of curvature of said gear and said opening formed therein being sufficient to permit the insertion of said gear through said wall, said cylindrical wall corresponding in length to the axial dimension of said gear, said capsule further having disc-shaped end walls on said cylindrical wall to limit axial movement of said gear, at least one of said end walls having an opening formed therein to permit insertion of a shaft to engage said gear, said opening in said cylindrical wall being further of sufficient circumferential dimension to permit engagement of said gear by a further gear outside said capsule, whereby said capsule with said gear may be assembled in said gear housing as a unit.

4,011,775
TRANSMISSION INCLUDING A HYDRODYNAMIC TORQUE CONVERTER

Karl Gustav Ahlen, Bromma Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden

Filed Feb. 12, 1975, Ser. No. 549,371
Claims priority, application United Kingdom, Feb. 14, 1974, 6856/74; Dec. 18, 1974, 54769/74
Int. Cl.² F16H 47/00
U.S. Cl. 74—732 6 Claims



1. A transmission including a hydrodynamic torque converter of the type having a turbine member which has a turbine shaft operatively associated therewith, rotatable casing member having a pump part operatively associated therewith and a stationary housing, and utilizing a guide member having a guide vane ring mounted in a guide vane shaft, which guide member in one driving range acts as a turbine part for transmitting torque via a gear to the turbine shaft and which, in another driving range, is held stationary to function as a stationary guide vane ring, characterized in that between the guide vane shaft and the turbine shaft there is disposed an engageable and releasable planet gear and between said guide vane shaft and the stationary housing there is disposed a brake to stall the guide vane shaft or release it for rotation in either direction, and in that independent radial and axial bearings are included between each of the said members of the torque converter and the other members thereof allowing radial displacement within the clearance of the radial bearing independent of axial force on the axial bearing.

4,011,776
TRANSMISSION

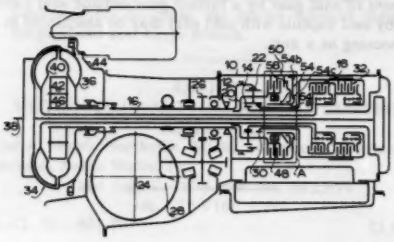
Masayuki Kodama, and Shintaro Uchiyama, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

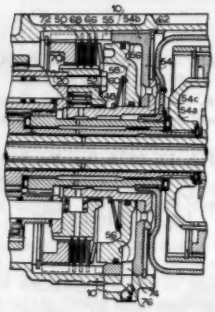
Filed Nov. 20, 1975, Ser. No. 633,918

Claims priority, application Japan, Dec. 2, 1974, 49-145587[U]

Int. Cl.² F16H *3/44*

U.S. Cl. 74—789 **5 Claims**





1. In a transmission,
a casing made of a first material,
a planetary gear unit coaxially disposed in said casing,
said planetary gear unit including a carrier of planetary gears,
a one-way brake means for braking said carrier, said one-way brake means being coaxially disposed in said carrier, said one-way brake means including an inner race and an outer race,
said outer race being secured to said carrier,
a member comprising a first part made of a second material and a second part made of said first material,
said first part forming said inner race, said second part being secured to said casing, and
said first and said second part being secured to each other, whereby a driving torque reaction on said carrier is received on said casing through said one-way brake means and said member.

4,011,777
MULTI SPINDLE LATHES

Edmund Alexander McConnell, Coventry, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

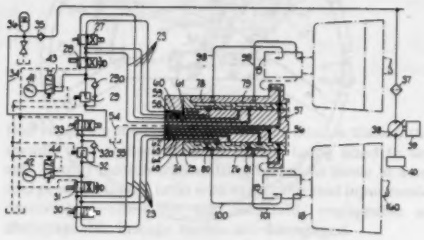
Filed Sept. 8, 1975, Ser. No. 610,913

Claims priority, application United Kingdom, Sept. 12, 1974, 39745/74

Int. Cl.² B23B *3/34, 19/02, 5/22*

U.S. Cl. 82—3 **10 Claims**

1. In a multi-spindle lathe having an indexable drum mounted on a fixed part of the lathe, a plurality of work spindles rotatably mounted in the drum, chucks on the respective spindles, fluid pressure operated piston and cylinder units on the respective spindles to actuate the chucks thereon, the combination comprising:
a fluid distributor to distribute fluid to and from the respective units to cause actuation of the chucks in predetermined sequence, the distributor having a part fixed to the drum and indexable with it, fluid connections being provided between said part of the distributor and the respective units, the distributor also having a further part non indexable with the drum and secured with respect to a fixed part of the lathe; and



at least two valves on the fixed part of the lathe, arranged to control flow of fluid to the further part of the distributor and connected thereto by fluid connections, one of the valves being arranged to select the direction of flow of fluid to and from the distributor to actuate the chucks in either of two opposite directions for internal or external gripping, and the other of the valves being arranged to select the pressure of fluid to the units at either of two different fluid pressures, the valves being connected to control a plurality of the units on the respective spindles of the lathe.

4,011,778
ADJUSTABLE WRENCH

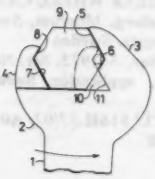
Lars Magnus Delin, Strandvagen 37, S-182 62 Djursholm, Sweden

Filed June 19, 1975, Ser. No. 588,506

Claims priority, application Sweden, June 24, 1974, 7408269

Int. Cl.² B25B *13/12*

U.S. Cl. 81—186 **2 Claims**



1. An adjustable wrench, comprising in combination:
a. a handle;
b. a rigid jaw integral with said handle and a slidable jaw adjustably carried on said handle;
c. each of said jaws having a first longer wrenching face and an adjacent second shorter wrenching face,
1. said wrenching faces of both jaws intersecting each other at an angle of 120° for simultaneously engaging two adjacent sides of a hexagonal nut,
2. said first wrenching faces being engageable with diametrically opposite sides of the nut, and engaging along the entire sides of the nut, said second wrenching faces being engageable with diametrically opposite sides of the nut,

3. the distal end of said movable jaw having an extent from said angle which is less than the length of its said first wrenching face,
4. the root of said rigid jaw having a transverse recess extending therethrough between said second shorter wrenching face of said rigid jaw and said handle, and
5. said first wrenching face of said movable jaw being receivable in said transverse recess along the entire width of said first wrenching face.

4,011,779

APPARATUS FOR CUTTING AN ELONGATE MEMBER OF ARBITRARY LENGTH INTO SHORTER SECTIONS OF PREDETERMINED LENGTHS

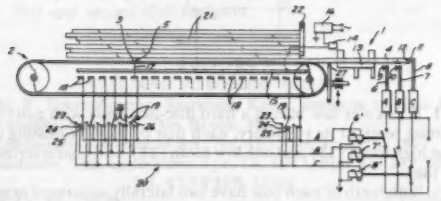
Gudbrand Gunnarson Berg, 2890 Bruflat, Bruflat, Norway

Continuation-in-part of Ser. No. 549,625, Feb. 13, 1975, abandoned, which is a continuation of Ser. No. 447,176, Feb. 28, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,887

Claims priority, application Norway, Mar. 1, 1973, 73836

Int. Cl.² B26D *5/38, 5/20*

U.S. Cl. 83—71 **8 Claims**



1. An apparatus for cutting an elongate member of arbitrary length into shorter sections of predetermined respective lengths, comprising a cutting element, means for advancing the elongate member past the cutting element, a plurality of abutment members located at different positions forward of the cutting element, operating means whereby the abutment members are selectively brought into and removed from the path of movement of the elongate member, a plurality of sensor devices arranged at equally spaced intervals to the rear of the cutting element for sensing the length of the elongate member that is to the rear thereof, the programmable means connected between the sensor devices and said operating means to determine which of said abutment members is brought into the path of movement of said elongate member, and thereby the length of the elongate member that is forward of the cutting element, in dependence upon the length of the elongate member that is to the rear of the cutting element; and wherein the means for advancing the elongate member comprise a member engaging the rear end of the elongate member, and the apparatus further comprises an electrical conductor extending parallel to the path of movement of the elongate member at the rear of the cutting element and a contact member engaging the rear end of the elongate member and slidably connected to said electrical conductor and engaging the sensor devices as the elongate member is advanced thereby to indicate the position of the rear end of the elongate member.

4,011,780

APPARATUS FOR TRIMMING AND/OR SUBDIVIDING MILL PRODUCT AT A COIL FORMING STATION

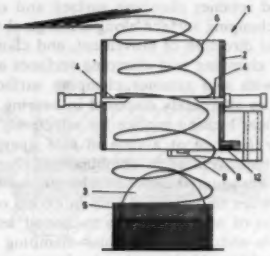
Siegfried David, Hilchenbach, Germany, assignor to Morgan Construction Company, Worcester, Mass.

Filed Mar. 10, 1976, Ser. No. 665,402

Claims priority, application Germany, Apr. 10, 1975, 2515643

Int. Cl.² B21F *11/00*

U.S. Cl. 83—167 **6 Claims**



1. Apparatus for trimming and/or subdividing a product length, for example rolled rod which has previously been formed into a series of rings, said apparatus comprising: an upstanding cylindrical reforming chamber positioned to receive and guide said rings downwardly along a vertical path of ring descent; a support positioned beneath said reforming chamber to receive the rings descending therethrough and to collect said rings in coil form; separating means movable into said reforming chamber to interrupt the descent of rings therethrough, with the rings thereafter accumulating on said separating means being connected to the rings accumulated in coil form on said support by a single connecting strand; a plurality of stationary first shear blades circumferentially spaced around the periphery of the path of ring descent at a level beneath that of said separating means; and a plurality of catching arms movable across the path of ring descent to carry the connecting strand towards one of said stationary shear blades, each of said catching arms having a second shear blade arranged thereon to cooperate with one of said first shear blades to cut the connecting strand.

4,011,781

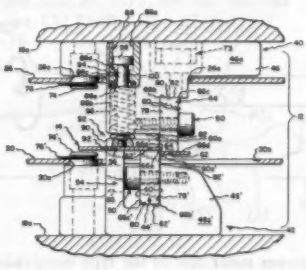
CUTOFF DIE

Lawrence V. Whistler, Jr., 251 Doncaster Road, Kenmore, N.Y. 14217

Filed Jan. 9, 1976, Ser. No. 648,000

Int. Cl.² B26D *7/02, 7/26*

U.S. Cl. 83—387 **13 Claims**



1. In a device for severing a workpiece including a punch unit, a die unit each of said punch and die units having at least one elongated cutting edge adapted to be arranged in an operative cutting position, and means for moving said punch

and die units relatively towards one another with said cutting edges arranged in said operative cutting position to effect severing of said workpiece, wherein at least one of said punch and die units includes a steel having a rectangular cross-sectional configuration defined by parallel clamping surfaces and parallel bearing surfaces, said clamping and bearing surfaces cooperating to form at their junctures four elongated cutting edges; a retainer for supporting said steel, said retainer defining a retainer clamping surface arranged parallel to the direction of movement of said punch and die units relatively towards one another and a retainer bearing surface arranged normal to said retainer clamping surface and connected to said retainer clamping surface along a marginal edge thereof training in said direction of movement, and clamping means for releasably clamping said clamping surfaces alternately in engagement with said retainer clamping surface with said bearing surfaces alternately disposed in bearing engagement with said retainer bearing surface for selectively placing said four cutting edges one at a time in said operative cutting position; the improvement in combination, characterized in that said steel has squared ends and a lengthwise dimension as measured between said squared ends in excess of the lengthwise dimension of said retainer as measured lengthwise between opposite ends of said retainer clamping and bearing surfaces, and said steel is formed with a locator receiving bore opening extending between said clamping surfaces and being arranged centrally thereof, said retainer is formed with a locator receiving opening passing through said retainer clamping surface and arranged centrally between said opposite ends and spaced from said retainer bearing surface through a distance corresponding to the spacing between said locator receiving bore opening and said bearing surfaces, said one of said punch and die units additionally includes a locator pin having first and second ends, said first end being positionally fixed within said locator receiving opening of said retainer, and said second end is shaped and sized to slidably engage only with facing wall surfaces of said locator receiving bore opening disposed immediately adjacent a plane passing centrally through said locator receiving bore opening and arranged parallel to said bearing surfaces, whereby said second end and said facing wall surfaces cooperate to center said steel in a direction lengthwise of said retainer clamping surface with said squared ends projecting equidistances beyond said opposite ends.

4,011,782

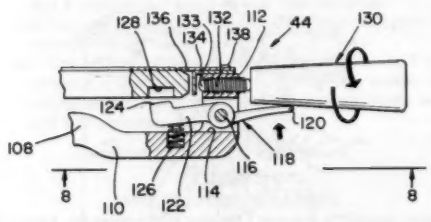
POWER MITER SAW

Donald Lawrence Clark; Floyd Samuel Fraunfelter, Jr., both of Lancaster, Pa., and Robert Richard Ruth, Baltimore, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 25, 1975, Ser. No. 616,610

Int. Cl.² B27B *5/20*

U.S. Cl. 83—471.3 **24 Claims**



1. In a power miter saw of the type comprising a bridge-shaped base and a swinging lever pivotally mounted therebelow for motion about a vertical axis, the improvement comprising mounting means at the rear end of said swinging lever for mounting saw means thereon, said mounting means comprising means to normally bias said saw means to an up position with respect to said base, said mounting means comprising means to define the upper and lower limits of motion of said saw means with respect to said base, and said mounting means comprising means to manually lock said saw means in a down position in closely spaced relation to said base, said mounting means comprising a saw arm carrying said saw means on the forward end thereof, said mounting means comprising a pair of boss portions formed one on said saw arm and the other on the rear end of said swinging lever, a pin member carried by one of said boss portions, an arcuate slot and a hole deeper than the depth of said arcuate slot formed in the other of said boss portions, said pin member being so configured with respect to said one of said boss portions that the free end of said pin is positioned in said arcuate slot formed in said one of said boss portions in the assembled together condition of said boss portions, and said hole being located at the end of said slot corresponding to said down position.

4,011,783

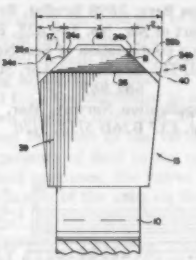
CIRCULAR SAW

Leonard James Mobley, Tallmadge, Ohio, assignor to Lear-Sigler, Inc., Santa Monica, Calif.

Filed Jan. 22, 1976, Ser. No. 651,572

Int. Cl.² B23D *45/00;* **B27B** *33/08*

U.S. Cl. 83—846 **1 Claim**



1. A circular saw having a hard disc-like body with pairs of cutting teeth at its periphery, each pair of teeth consisting of one high tooth (13) and one low tooth (15), and characterized in that:

a. both teeth of each pair have two laterally-separated negatively-raked cutting edges which slope toward each other from the sides of the tooth to a transverse radially outer cutting edge which is parallel to the rotational axis of the saw;

b. the transverse radially outer cutting edge of each high tooth (13) being radially offset a greater distance from the rotational axis of the saw than the corresponding transverse edge of each low tooth 15; and

c. the negatively-raked sloping cutting edges of each low tooth (15) being laterally separated a greater amount than the lateral separation between the negatively-raked sloping cutting edges of each high tooth (13).

4,011,784

TRANSPOSITION APPARATUS FOR AN ELECTRONIC MUSICAL INSTRUMENT

Tutomu Fukui, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 420,501, Nov. 30, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,086

Claims priority, application Japan, Dec. 19, 1972, 47-127395

Int. Cl.² G10H *1/00*

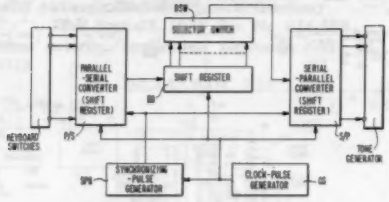
U.S. Cl. 84—1.01 **2 Claims**

1. A transposition apparatus for an electronic musical instrument having a plurality of keyboard switches comprising:

a. first shift register having a plurality of stages equal to the

number of keyboard switches plus a number of additional stages equal to the number of desired transpositions, each of said switches being connected to the input of a corresponding first shift register stage, said first shift register converting the parallel keying pattern represented by switches actuated by keys on said musical instrument to a serial pulse signal where the bit positions of the pulses in said signal correspond to said actuated switches, said additional stages serving to prevent signals for low-pitch tones from being shifted as signals for high-pitch tones,

b. delay means connected to receive said serial pulse signal for delaying the signal by a predetermined number of bit positions,



c. second shift register connected to receive the delayed serial pulse signal for converting the received signal to a parallel keying pattern transposed from said original keying pattern, said transposed keying pattern being used to control the tone generator in the musical instrument,

d. a clock-pulse generator connected to both of said first and second shift registers to shift bits out of said first shift register and to shift bits into said second shift register, and

e. a synchronizing-pulse generator connected to receive clock pulses from said clock-pulse generator and periodically producing a synchronizing pulse to reset both of said first and second shift registers.

4,011,785

NAIL AND POWERED NAILER

John R. Schrepferman, Merriam, Kans., assignor to Bliss & Laughlin Ind., Inc., Oak Brook, Ill.

Continuation-in-part of Ser. No. 153,756, June 16, 1971, abandoned. This application Apr. 18, 1973, Ser. No. 352,243

Int. Cl.² F16B *15/00*

U.S. Cl. 85—10 R **5 Claims**

1. A full headed nail comprising,

a shank member and a flat head member,

said head member having a peripheral edge defining a pair of arcuate sections disposed at opposite ends of a major diametrical axis and a pair of parallel segmented portions of equal length disposed at opposite ends of a minor diametrical axis,

the length of said major diametrical axis being substantially greater than twice the diameter of said shank member,

the length of said minor diametrical axis being substantially equal to twice the effective diameter of said shank member,

the major portion of its shank being surface finished with minute pits having small sharply shaped walls as produced with grit-blasting the shank with No. 80 grain size aluminum oxide grit to frictionally engage wood fibers without tearing them when passing laterally therethrough.

4,011,786

EXPANDABLE DOWEL

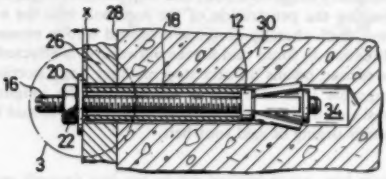
Heinrich Liebig, Wormser Strasse 23, Pfungstadt, Germany

Filed Dec. 5, 1975, Ser. No. 637,957

Claims priority, application Germany, Dec. 10, 1974, 2458317

Int. Cl.² F16B *13/04*

U.S. Cl. 85—74 **8 Claims**



1. An expandable dowel for insertion into a borehole, comprising: expandable sleeve means with at least one slot extending from one end thereof, at least one expanding member engaging said sleeve means at said one end for expansion thereof, spacer sleeve means adjacent that end of said expandable sleeve means which is opposite said one end and having an end face, a screw-threaded bolt in screw-threaded engagement with said expanding member and having a shaft which is passed through said spacer sleeve means and said expandable sleeve means, means on said screw-threaded bolt adjacent said spacer sleeve means for retaining said spacer sleeve means on said screw-threaded bolt, and washer means located between said spacer sleeve means and said means on said screw-threaded bolt, said washer means having a first substantially flat portion located outside the projection of a borehole into which the dowel is to be inserted and a second portion within the projection of the borehole, said second portion being provided with deformable sections bent outwardly with respect to the plane of said washer means and extending in a direction toward said spacer sleeve means, whereby upon tightening of said means on said screw-threaded bolt said sections first engage said end face of said spacer sleeve means and thereafter are deformed back into the plane of said washer means.

4,011,787

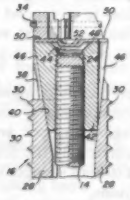
MINE ROOF BOLT ASSEMBLY

Lewis P. White, 3436 Brookwood Road, Birmingham, Ala. 35223, and Francis E. White, 1437 Panorama Drive, Vestavia Hills, Ala. 35216

Filed June 20, 1975, Ser. No. 588,904

Int. Cl.² F16B *33/04*; **E21D** *21/00*

U.S. Cl. 85—76 **9 Claims**



1. A mine roof bolt assembly including:

a. a roof bolt, one end of which is threaded,

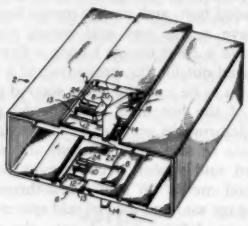
b. an expansion shell threadedly engaged with the threaded end of said roof bolt and comprising a plurality of leaves,

c. a first means for normally holding said leaves together,
d. said expansion shell further including wedge means between said leaves in threaded engagement with the threaded end of said roof bolt, a portion of said wedge means engaging said leaves for forcing the latter outwardly upon movement of said wedge means longitudinally of said roof bolt and leaves,
e. a stop member positioned between said leaves beyond the threaded end of said roof bolt,
f. said stop member including a body portion in the path of the threaded end of said roof bolt,
g. said stop member body portion having means for engaging the central part of the terminal of the roof bolt threaded end and spacing the body portion from the periphery of the roof bolt, said stop member engaging and limiting the penetration of the roof bolt into the expansion shell whereby movement of said wedge means in a direction to force said leaves outwardly, is effected, and
h. a second means on said stop member body portion engageable with said leaves for limiting the longitudinal movement of the stop member with respect to said leaves under urging of said roof belt.

4,011,788
STRIPPER/DE-LINKING MECHANISM

Frederick P. Reed, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 16, 1976, Ser. No. 649,627
Int. Cl.² F41D *9/02*
U.S. Cl. 89—33 C **8 Claims**



1. In an automatic or semiautomatic weapon system having a receiver including a firing chamber, an ammunition belt feed tray mechanism for feeding rounds individually to said firing chamber, an ammunition belt of the disintegrating type in said tray mechanism, with individual round link members, each of said members totally circumscribing its corresponding round, and weapon system recoiling parts, the improvement comprising:

link stripper and delinker means carried by said feed tray mechanism adjacent said firing chamber for movement from a first position to a second position to strip and delink each link from the next succeeding link in the linked belt prior to introduction of the delinked round into the receiver,

said stripper delinker means comprising a pair of spaced units, each unit comprising a movable body member having a link engaging stripper and delinking shoulder, and guide means carried by the feed tray mechanism for guiding movement of said stripper delinker body member between said positions.

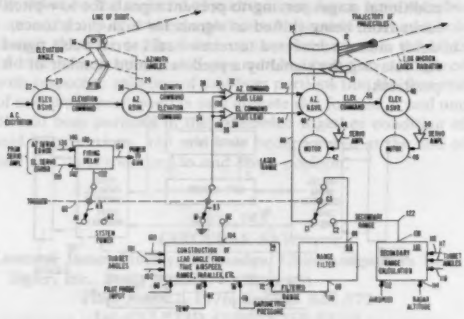
means carried by the recoiling parts to actuate movement of the stripper delinker means from said first position to said second position to effect said stripping and delinking function, and

means for automatically moving said stripper delinker means from said second position to said first position upon completion of the stripping and delinking function.

4,011,789
GUN FIRE CONTROL SYSTEM

Louis B. Bresee, Jr., So. Burlington; Charles A. Brownlee, Essex Junction, and Robert A. Leightner, Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed May 6, 1974, Ser. No. 467,529
Int. Cl.² F41G *3/02*
U.S. Cl. 89—41 EA **5 Claims**



1. In a gun and fire control system having:

a gun, mounted in a turret which is aimed by a servo system, and having a firing mechanism and a trigger to fire said gun;

a remote gunner's sight for providing target elevation and azimuth signals to said servo system;

a computer for providing a lead angle signal to said servo system;

the improvement of:

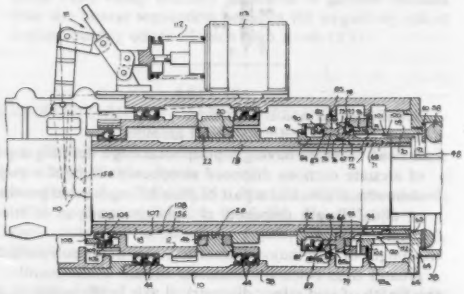
a laser range finder mounted to and boresighted with said gun, for providing a real target range signal to said computer;

first means coupled to said servo system, to said computer and to said trigger for decoupling said lead angle signal from said servo system until said trigger is actuated to fire said gun, and upon said trigger being actuated to fire said gun, coupling said lead angle signal to said servo system to cause said servo system to drive said gun and said laser range finder from a line of sight orientation while said gunner's sight remains unaffected and available for continuing to provide target elevation and azimuth signals to said servo system to a line of fire orientation.

4,011,790
RECOIL CONVERTER FOR SELF POWERED GUN

Lawrence Ray Folsom, Schenectady, N.Y., and Roger Eugene Gaboriault, Williston, Vt., assignors to General Electric Company, Burlington, Vt.

Filed July 28, 1975, Ser. No. 600,179
Int. Cl.² F41D *3/06*
U.S. Cl. 89—162 **10 Claims**



1. A gun having a cycle of operation and comprising:

a housing;

gun barrel means journaled for reciprocation relative to said housing;

an operating mechanism including means journaled for rotation relative to said housing and rotating continuously through said cycle of said gun;

motion conversion means for converting reciprocation to rotation; and

coupling means for coupling said motion conversion means to and between said gun barrel means and said operating mechanism for less than the totality of said cycle of operation of said gun.

4,011,791

TOOL CHUCKING DEVICE

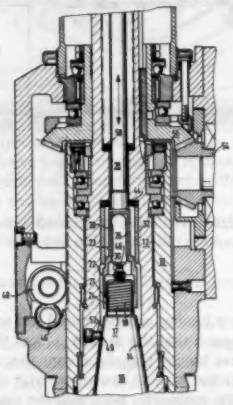
Horst Lanzenberger, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed Sept. 25, 1975, Ser. No. 616,588

Claims priority, application Germany, Oct. 23, 1974, 2450323

Int. Cl.² B23C *5/26*

U.S. Cl. 90—11 D **9 Claims**



1. A tool chucking device having an axially displaceable draw-in bar mounted inside a hollow spindle, and carrying a coupling head means thereon which is adapted to positively engage a shank of a tool, comprising the improvement wherein said coupling head means includes a slotted resiliently expandable sleeve-like member having an internal grooved profile, wherein said tool shank has a complementary external grooved profile adapted to engage said internal grooved profile, wherein expanding means are provided for expanding the slotted sleeve-like member during a displacement in ejecting direction for the purpose of releasing the tool shank and wherein said expanding means comprises stationary pin means projecting into a slot in said slotted sleeve-like member, said pin means and said slotted sleeve-like member having cooperating cam faces which make mutual contact during said displacement of said slotted sleeve-like member in said ejecting direction to thereby cause said sleeve-like member to be expanded.

4,011,792

ROTARY TOOL EXHAUST HOOD

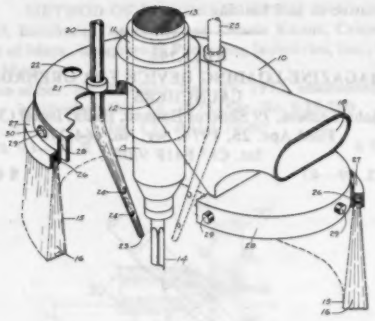
Wallace J. Davis, Route 11, Box 290, Lenoir, N.C. 28645

Filed Nov. 7, 1975, Ser. No. 629,868

Int. Cl.² B23C *1/00*; B23B *51/06, 39/00*

U.S. Cl. 90—11 R **3 Claims**

1. A machine tool having in combination a motor driven chuck carrying a rotary cutting tool which, in operation, throws off a stream of relatively heavy chips and other particles, a hood or bonnet mounted on the machine having means providing for axial adjustment of the same, said hood having a body extending over an area surrounding the tool, a skirt attached to the hood and arranged to drop down around and enclose the tool, said skirt embodying bristles incorporating appropriate interstices for admitting ambient air, said hood having an exhaust opening for connecting the same with an exhaust system, the suction from which draws a suction air



stream through and out of the hooded space, and means for introducing under the hood a jet of air under pressure directed at said stream of chips, disbursing the same into the suction air stream for effective capture and withdrawal of the chips with the air stream.

4,011,793

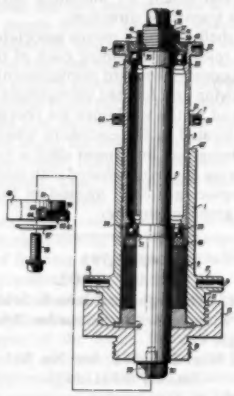
PORTABLE BORING BAR

Ernest E. Grimsley, 4533 Wake Forest Road, Portsmouth, Va. 23703

Filed Oct. 7, 1975, Ser. No. 620,408

Int. Cl.² B23C *1/20*

U.S. Cl. 90—12.5 **10 Claims**



1. A tool adapted for boring the seal ring seats of high pressure valves, said tool comprising:

a hollow cylindrical housing support having threads on its interior surface;

a rotatable cylindrical feed screw having exterior threads thereon for engaging the threads on said interior surface;

means holding a cutting tool;

a drive shaft extending through and beyond said feed screw and said housing support, said drive shaft having a diameter much smaller than the internal diameter of said feed screw;

means at one end of said drive shaft for connecting said

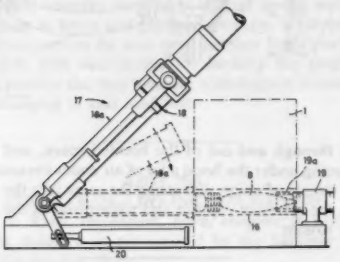
drive shaft to a driving means and means at the other end for receiving said means holding a cutting tool;

first and second bearing means mounted inside said feed screw rotatably supporting said drive shaft in fixed relation to said feed screw whereby said drive shaft and tool holder are moved axially as said feed screw is rotated relative to said housing support.

4,011,794
MAGAZINE-LOADING DEVICE FOR GRENADE LAUNCHERS

Matatjahu Leshem, 79 Shderot Hanassi, Haifa, Israel (34642)

Filed Apr. 25, 1974, Ser. No. 464,276
Int. Cl.² F41F *9/06*
U.S. Cl. 89—47 **8 Claims**



1. A magazine-loading device for loading grenade launchers with shells comprising, in combination:

a. an elongated shell storage enclosure which is upwardly inclined with respect to the horizontal, for receiving a series of shells in side-by-side relationship and transversely directed with respect to the longitudinal axis of said enclosure, the enclosure including an ovally recessed surface for contacting the corresponding side surfaces of said shells and means for inhibiting movement of said shells in the transverse direction;

b. releasable shell retaining means associated with the enclosure for releasably retaining each of the shells in the enclosure against downward displacement under gravity;

c. a shell receiving unit located substantially horizontally at the lower end of the enclosure for receiving the lowermost shell located in the enclosure when said retaining means retaining said lowermost shell is released; and

d. shell displacing means associated with said shell receiving unit for displacing a shell located in the unit into the barrel of a grenade launcher.

4,011,795
IMPACT TOOL

Henry P. Barthe, Pittsburgh, and John S. Schroeder, Sewickley, both of Pa., assignors to Schroeder Brothers Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1975, Ser. No. 561,419
Int. Cl.² F01L *25/04*
U.S. Cl. 91—286 **4 Claims**

1. A hydraulic impact tool for use in a hydraulic system comprising a pump, hydraulic fluid, and reservoir, said tool comprising:

A. a housing defining a cylindrical bore having a central portion of increased section,

B. a ram slidable in the housing between stored energy and impact positions.

C. an energy storage means for biasing the ram toward the impact position,

D. said ram having lift and closure cylindrical pistons secured thereto so that the housing, the ram and the pistons define at least two chambers, one between the pistons having a fixed volume and an expansible volume lift chamber,

E. said ram between said pistons having two cylindrical portions of different cross section,

F. axially spaced ports comprising:

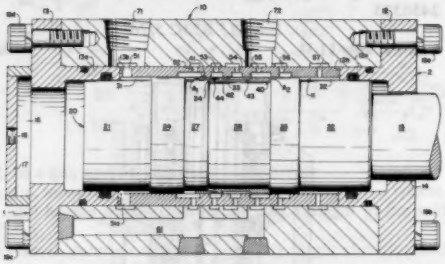
at least one main transfer port opening into said fixed volume chamber,

at least one main exhaust port opening to said fixed volume chamber,

at least one slid valve exhaust port opening to said fixed volume chamber but closable by said lift piston on said ram,

at least one main inlet port opening to said fixed volume chamber,

at least one lift chamber transfer port opening into said expansible volume lift chamber, all said main transfer and lift chamber transfer ports being in direct communication,



G. a cylindrical valve sleeve positioned within the said fixed volume chamber and movable relative to the ram and housing,

1. said sleeve having a radial end surface having an area A_1,

2. said sleeve having another radial end surface having an area A2 such that the area A_1 is less than the area A_2,

3. said sleeve having transfer means thereon for connecting either the main exhaust port with the main transfer port or the main inlet port with the main transfer port,

the aforesaid ram, valve sleeve and axially spaced ports arranged such that the sleeve is carried mechanically in one direction by the lift piston until the surface A_2 enters the main inlet port and thereafter the sleeve is moved relative to the ram by hydraulic pressure and such that the slide is carried mechanically in the other direction until the ram lift piston opens the slide valve exhaust port and thereafter, the valve sleeve is moved relative to the ram by hydraulic pressure.

4,011,796
RADIAL HYDRAULIC PUMP OR MOTOR WITH IMPROVED PISTONS AND SLIPPERS

Lewis C. Erickson, 3328 E. Superior St., Duluth, Minn. 55804

Filed Jan. 16, 1975, Ser. No. 541,401
Int. Cl.² F01B *13/06*
U.S. Cl. 91—488 **7 Claims**

1. A fluid pump or motor comprising:

a. housing means having a central opening in one side thereof and having fluid inlet and outlet ports therein, said housing means having slipper bearing means formed in the end thereof opposite said central opening, the axes of said slipper bearing means and the central opening being eccentrically aligned;

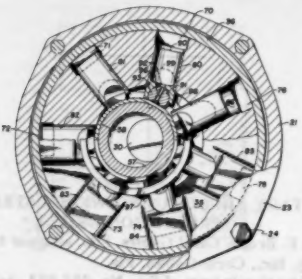
b. shaft means rotatably supported within the central opening of said housing means;

c. piston means for operating in a cylinder, the end portion nearest the axis of said shaft having a slot formed therein of circular cross-section segment exceeding 180°, the axis of which is parallel to that of said shaft means;

d. a slipper of substantially circular cross-section nested in each slot of each piston means, said slipper extending beyond the walls of each piston in reduced and equal radial configuration;

e. a pair of retaining rings secured over the outer radial surface of that portion of each slipper extending beyond the walls of each piston means;

f. rotor means having a plurality of radially arranged cylinders, each cylinder having a port at the outer end thereof, and having the walls of each cylinder nearest the center of said rotor means being cut away to allow clearance for said slipper and piston means assembly to the degree said



piston means is entirely contained within said cylinder at its maximum point of eccentricity, said rotor means being fixedly secured to said shaft;

g. and radial valve means having a first part secured to said housing means and communicating with said inlet and outlet ports and having a second part formed in said rotor means with a plurality of conduits and ports communicating respectively with each cylinder port.

4,011,797

OIL-COOLED PISTON FOR A HEAT ENGINE

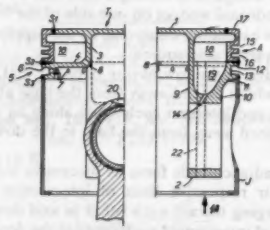
Andre Cornét, Levallois-Perret, France, assignor to DAMPERS Societe Anonyme, Boulogne, France

Filed July 15, 1974, Ser. No. 488,228

Claims priority, application France, July 19, 1973, 73.26584

Int. Cl.² F02F *3/20*

U.S. Cl. 92—186 **24 Claims**



1. An oil-cooled piston comprising a crown, a radial flange and means axially offsetting said flange beneath said crown, a ring section rigidly secured to said crown and flange for piston-ring support and defining therewith a circumferentially continuous annular oil chamber axially between said flange and crown and radially within the piston-ring support region of said ring section, a cylindrical skirt rigid with said flange and extending axially downward therefrom, two laterally spaced downward projections independent of said skirt and rigid with said crown and flange at opposed radial offsets from the piston axis and in radial clearance relation with said skirt, transversely aligned wrist-pin bearing means in said projections at a location axially beneath said flange and ring section, each of said projections having an upwardly open cavity extending from the region of said wrist-pin bearing means and upwardly through said flange and thus forming a local axially downwardly extending region of the oil chamber, and inlet and outlet flow-circulating means communicating with the chamber.

4,011,798

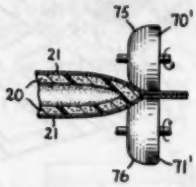
METHOD OF MAKING SHIPPING BAG

John D. Bambara, Osterville, and Dennis Knaus, Centerville, both of Mass., assignors to Packaging Industries, Inc., Hyannis, Mass.

Division of Ser. No. 419,923, Nov. 29, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,700

Int. Cl.² B31B *39/60*

U.S. Cl. 93—35 R **8 Claims**



1. A method of making a cushioned bag of multilayer material having first and second exterior faces formed by outer surfaces of at least one exterior layer of relatively thin, fibrous, and flexible sheet material, an inner layer lining substantially the entire bag interior and comprising at least one sheet of foamed plastic; the method comprising the steps of:

automatically bringing together along a path of travel two long sections of the multilayer material,

positioning surfaces of the foamed plastic of the sections adjacent one another inside the thin, fibrous and flexible sheet of the two sections to form outer layers from the thin, fibrous and flexible sheet,

joining together the two long sections at intervals spaced along the length thereof to form attached bags of the multilayer material, said step of joining comprising applying sufficient heat and pressure to the two sections at said intervals to entirely collapse the foamed plastic along thin strips transverse to the path of travel and to join the outer layers of the thin, fibrous and flexible sheet substantially face-to-face along the strips, thereby forming a bonded together, two layer, marginal seam area where the outer surface forming, thin, fibrous, and flexible sheets are securely joined together,

forming adjacent the transverse strips a continuum of the foamed plastic spanning the joined strips inside the bag, said step of forming a continuum including applying less heat and pressure than applied to the transverse strips adjacent the transverse strip towards the bag interior to join the adjacent surfaces of the foamed plastic absent total collapse of the foam, thereby forming a second joined internal seam area that includes the joined foam spanning the marginal seam area adjacent thereto,

whereby bag seams are formed with an improved seal and cushioning across the seam.

4,011,799

CARTON ERECTING APPARATUS

Francis A. Chidsey, Devon, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Nov. 10, 1975, Ser. No. 630,142

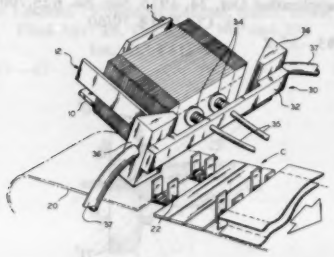
Int. Cl.² B31B *1/80*

U.S. Cl. 93—53 SD **6 Claims**

1. In an apparatus for erecting collapsible, open-ended, tubular cartons each comprising a plurality of foldably interconnected panels, the combination of:

a. a hopper member for holding a plurality of cartons in flattened condition;

b. a conveyor member positioned adjacent said hopper member and including retaining means, which are spaced from each other a distance equal to the width of an erected carton, for retaining erected cartons therebetween;
c. carton erecting and transfer structure mounted for reciprocal movement between said hopper member and said conveyor member;
d. said structure including:



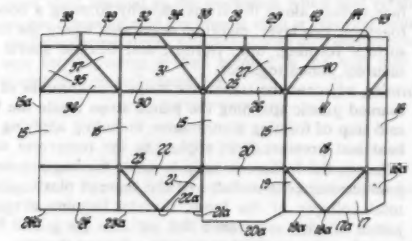
i. vacuum transfer means for engaging a panel of one of said cartons in said hopper member;
ii. moveable plenum means adjacent at least one end of said structure for applying positive air pressure against at least one end of said one carton to erect said carton as said carton is transferred by said structure from said hopper member to said conveyor member;
e. means for moving said structure between said hopper member and said conveyor member whereby said plenum means moves in unison with said vacuum transfer means.

4,011,800

BOTTOM SEAL HORN AND MANDREL

Jr. Walke, Wixom, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 31, 1976, Ser. No. 672,092
Int. Cl.² B32B *31/00*
U.S. Cl. 93—59 MT **17 Claims**



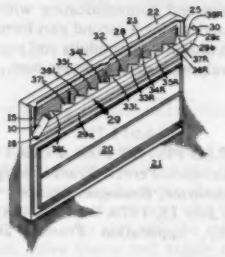
1. Vibration sealing apparatus for sealing a rectangular end closure of a thermoplastic coated paperboard carton, said apparatus comprising: a vibrating horn having a rectangular work face; a stationary mandrel having a rectangular work face for opposing the work face of the horn with the end closure of the carton therebetween; one of the rectangular work faces defining an elongated depression extending between a pair of opposite edges thereof with a predetermined depth; said one work face also defining a pair of spaced depressions associated with each of said opposite edges of the work face to which the elongated depression extends; said spaced depressions having a greater depth than the elongated depression; each pair of spaced depressions having a configuration cooperatively defined by the depressions thereof and being oriented to oppose the other pair of spaced depressions in a spaced relationship; at least one of the spaced depressions of each pair overlapping with the elongated depression from the same side thereof; the other work face having generally diagonal depressions defining a junction; and the other work face also including at least one triangular projection at the junction of the diagonal depressions.

4,011,801

UNITARY AIR-DIFFUSING WEDGE STRIP IN AIR PROJECTION GRILLE

Herbert F. Bruns, Coral Gables, Fla., assignor to Bruns Technology, Inc., Coral Gables, Fla.

Continuation-in-part of Ser. No. 385,833, Aug. 6, 1973, abandoned. This application May 6, 1975, Ser. No. 575,146
Int. Cl.² F24F *13/08*
U.S. Cl. 98—40 D **9 Claims**

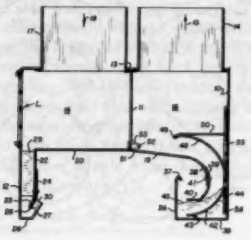


1. In an air diffuser to be mounted downstream from a source of pressurized supply air, said diffuser comprising:
a unitary wedge strip having a base and a row of adjoining, tetrahedronal wedges on one side of the base, said row of wedges extending transverse to the supply air flow downstream from said source;
each wedge in the row having opposite, flat, triangular side faces which extend away from the base at opposite acute angles and intersect each other along an apex line which is inclined away from the base in the downstream direction;
and the adjacent side faces of successive wedges in the row at their respective lines of intersection with the base converging toward each other in said downstream direction and intersecting each other at the downstream side of the wedge strip, whereby to provide channels for the supply air flow between successive wedges which at the base narrow to a point and provide V-shaped exit openings for the air at the downstream side of the wedge strip;
the improvement wherein:
the successive wedges along the row in at least one lateral direction outward from a reference point lean progressively toward the base, with the downstream edges of the laterally inboard side faces of successive wedges in said one lateral direction being progressively longer and the downstream edges of the laterally outboard side faces of said wedges being progressively shorter,
whereby the confronting side faces of said successive wedges compress and accelerate input supply air which is forced in and flows through the narrowing channels and out of the V-shaped exit openings to form coherent jets which induce surrounding ambient and supply air.

4,011,802
MAKEUP AIR DEVICE FOR GREASE EXTRACTION VENTILATOR

Victor D. Molitor, Denver, and Arlen W. Gallagher, Arvada, both of Colo., assignors to Stainless Equipment Company, Englewood, Colo.

Filed Jan. 27, 1975, Ser. No. 544,138
Int. Cl.² F23J 11/02
U.S. Cl. 98—115 K 6 Claims



1. The combination of a makeup air device and a grease extraction ventilator, wherein:

said ventilator is provided with an intake and means for adjusting the amount of air and smoke, grease and the like to flow through said ventilator;

said ventilator includes a water bath chamber having a front wall with said intake above said front wall;

a plate forms the lower boundary of a chamber for flow of the air and products passing through said water bath, the underside of said plate forming the upper boundary of said intake;

said makeup air device includes an air chamber adjacent said ventilator, a passage from said chamber leading to an outlet adapted to direct air toward said intake and means for adjusting the amount of air to be directed toward said intake;

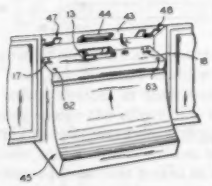
said makeup air chamber having a bottom wall adjoining said boundary plate and said passage extending downwardly from said air chamber to said outlet; and

said outlet having upwardly inclined walls for directing air towards said bottom wall of said makeup air chamber for flow past and along the underside of said boundary plate to said intake.

4,011,803
RANGE-HOOD INSTALLATION DEVICE

Leonard G. Pfaffinger, Morango, Ill., assignor to Aubrey Manufacturing, Incorporated, Union, Ill.

Filed Apr. 10, 1975, Ser. No. 566,974
Int. Cl.² F23J 11/00
U.S. Cl. 98—115 K 6 Claims



1. An installation mounting device facilitating the positioning and secure restraining of a suspended fixture assembly, said device comprising:

a. bracketing body means mounted onto a surface means against which said suspended fixture assembly will be juxtaposed, said bracketing body means including latching means to mechanically latch to said suspended fixture assembly,

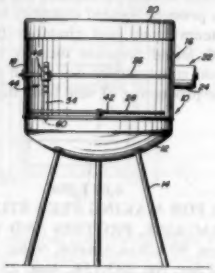
said bracketing body means comprising means for fixedly mounting said bracketing body means to said surface means so as to enable firm engagement of said bracketing body means juxtaposed to said surface means; and latching means including protruding portion means which insert through and automatically snap behind slotted orifice means to fixedly suspend said fixture means, and

b. said slotted orifice means on said suspended fixture assembly receiving said latching means to attach and maintain said suspended fixture assembly juxtaposed to the surface means onto which said bracketing body means is affixed.

4,011,804
GRILLE TENDER

James R. Crockett, Sr., 3327 Zuni Circle, Las Vegas, Nev. 89109

Filed Jan. 21, 1976, Ser. No. 651,158
Int. Cl.² A47J 37/04
U.S. Cl. 99—421 H 9 Claims



1. In combination, a broiler of the type including a horizontally disposed rotary grille mounted for rotation about an upstanding axis centrally disposed relative to the plan area of said grille and including sets of grille bars crossed relative to each other, a horizontal elongated motor-driven spit mounted above and extending across said grille, and an elongated drive member transversely mounted on said spit for rotation therewith and including one end portion projecting endwise outwardly from the spit a distance greater than the vertical spacing between said grille and spit engageable with successive grille bars of said grille upon swinging movement of said one end portion of said drive member through its lowermost arc of travel to intermittently angularly advance said grille each time said one end portion swings through said lowermost arc.

4,011,805
CONVECTION STEAMER APPARATUS AND METHOD FOR PROCESSING FOOD ITEMS OR THE LIKE

Elmer S. Vegh, Lyndhurst; William F. Castle, Cleveland; Leonard P. Hadbavny, Olmsted Falls; Donald F. Klier, Parma, and David S. Schwerzler, Cleveland, all of Ohio, assignors to Alco Standard Corporation, Cleveland, Ohio

Filed Feb. 19, 1975, Ser. No. 550,973
Int. Cl.² F24D 1/00; A47J 27/04, 27/16
U.S. Cl. 99—467 12 Claims

1. A convection steamer apparatus having improved heat-transfer characteristics for processing food items or the like comprising,

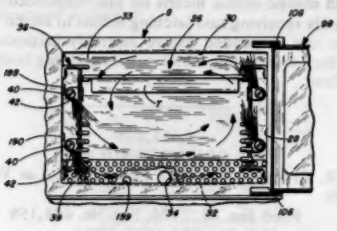
at least one steam chamber defined by a bottom, top, rear and oppositely disposed side walls adapted to receive food items in supported relation therein,

steam generator means for supplying regulated amounts of steam under pressure into said chamber,

distribution means including a plurality of spaced-oppositely disposed pipe means disposed adjacent associated of

said side walls adapted to deliver substantially dry steam in a generally orbital path around food items to be processed within said chamber,

diffuser means operably connected to said steam generator means and directly communicating with said distribution means for introducing substantially dry steam into said distribution pipe means, and



pressure differential generator means communicating with said chamber exteriorly thereof for inducing a substantially zero pressure in said chamber by removing air and unused steam from said chamber by condensing said steam with liquid pressure thereby to induce turbulent flow of said substantially dry steam in said orbital path during the processing of said food items.

4,011,806

APPARATUS FOR MAKING FEED STUFF CONTAINING BAGASSE, PROTEIN AND YEAST

Yosiaki Kimura, 902, Aza-Ameku, Naha, Okinawaa, Japan

Division of Ser. No. 283,156, Aug. 23, 1972, Pat. No. 3,903,307. This application May 19, 1975, Ser. No. 578,488

Claims priority, application Japan, Aug. 30, 1971, 46-65808; Aug. 30, 1971, 46-66421; Aug. 30, 1971, 46-65806; Aug. 30, 1971, 46-65807

Int. Cl.² A23N *17/00*

U.S. Cl. 99—485 **10 Claims**

1. In a plant for providing feed suitable for consumption by animals, fermentation means for providing a fermentation product from a material such as a suitably treated raw bagasse, supply means for supplying a substantially dry crushed product, mixing means, conveyer means extending between and communicating with said mixing means and said supply means as well as said fermentation means for conveying to said mixing means both the product supplied by said supply means and the fermentation product of said fermentation means, said mixing means being adapted to mix both of said products together, and shaping means operatively connected with said mixing means for receiving therefrom a mixture mixed by said mixing means and for providing from said mixture feed units having a shape determined by said shaping means, said shaping means including a pair of elongated endless belts situated one over the other for defining between themselves an elongated belt-shaped space for receiving the mixture from said mixing means and for forming the mixture into an elongated belt-shaped configuration, zig-zag means cooperating with said belts for receiving the belt-shaped product and for directing the latter back and forth along a zig-zag path in a drying atmosphere, said zig-zag means including conveyers which convey the product along said zig-zag path and which include wire-net members, the latter becoming separated from each other at a predetermined location, and a cutting means situated at the latter location and cooperating with said conveyers of said zig-zag means for cutting the dried product previously conveyed along said zig-zag path into predetermined lengths.

8. The combination of claim 1 and wherein a tank means communicates with said mixing means for adding to the mixture therein a nutritious product such as a suitable protein.

4,011,807

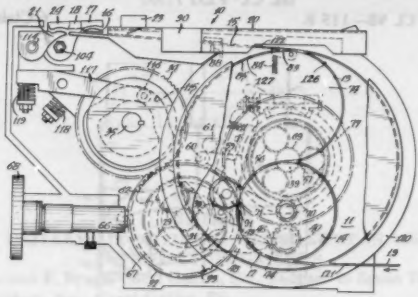
STRAP FEEDING AND TENSIONING MACHINE

Robert J. Kobiella, Rolling Meadows, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jan. 21, 1976, Ser. No. 650,923

Int. Cl.² B65B *13/02*

U.S. Cl. 100—2 **18 Claims**



10. A method of feeding strap about a package at a relatively high rate to form a loop and thereafter tensioning the formed loop about the package at a relatively lower rate comprising the steps of

directing a strap to a stationary winder drum and about a high-speed wheel rotatably mounted on said winder drum;

driving said high-speed feed wheel at a relatively high rate;

feeding strap about said high-speed wheel so as to form a loop about a package and provide overlapping strap portions at one portion of the loop;

terminating the strap feeding when a sufficient length of strap has been payed out to form said loop about the package;

holding the leading end portion of the strap looped about the package; and

thereafter rotating said winder drum at a relatively slow rate to pull tension in the strap forming the loop by winding the strap about the drum.

4,011,808

STRAPPING BAND GUIDE FOR AUTOMATIC STRAPPING MACHINE

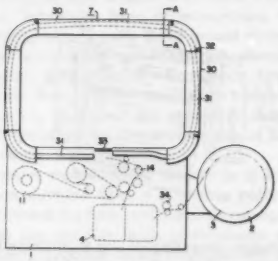
Minoru Aoki, and Yoshiaki Kasuga, both of Yokohama, Japan, assignors to Nichiro Kogyo Company, Ltd., Yokohama, Japan

Filed July 31, 1975, Ser. No. 600,596

Claims priority, application Japan, Aug. 5, 1974, 49-93885

Int. Cl.² B65B *13/04*

U.S. Cl. 100—26 **5 Claims**



1. In band strapping apparatus, a body having a table for supporting an article during banding, improved guide means through which a band may be fed endwise around said article and reversed and withdrawn therefrom to enwrap the article comprising:

an arch frame having an elongated side wall extending in the form of an upright loop from one side to another of said table;

an elongated U-sectioned arch guide having a shape following the contour of said side wall and a groove along one side defining a band passage;

biasing means pressing said one side of said arch guide to seat it against said side wall and thereby define a band passage in said arch guide closed by said side wall;

said arch guide being locally separable in a direction transverse to said side wall enabling it to deflect and progressively and continuously release band from said band passage along the length of said arch frame whereby said band is prevented from turning back on itself during said progressive release, and said arch guide is deflectible in a direction parallel to said side wall enabling it to be seated adjustably thereon despite minor variations in shape between said arch guide and said side wall and to accommodate undulations of said band during feeding thereof through said guide means.

4,011,809

PRESS WITH HYDRAULIC OVERLOAD SAFETY DEVICE AND RAM WEIGHT COUNTERBALANCING MECHANISM

Eugen Waller, Goeppingen; Wolfram Büchler, Donzdorf; Rolf Kellenbenz, Goeppingen; Franz Schneider, Goeppingen, and Burkhard Schumann, Goeppingen, all of Germany, assignors to L. Schuler GmbH, Germany

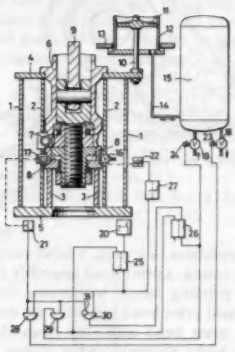
Filed Mar. 24, 1975, Ser. No. 561,166

Claims priority, application Germany, Apr. 3, 1974, 2416102; Jan. 15, 1975, 2501275

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² B30B *15/28, 15/14*

U.S. Cl. 100—48 **20 Claims**



1. A press comprising mechanical drive elements acting on a ram through at least one pressure cushion serving as a hydraulic overload safety device, at least one cylinder-piston unit means operating under the effect of a compressed fluid for counterbalancing the weight of the ram associated with an upper die of the press, and a control system for adjusting fluid pressure in the cylinder-piston unit means to a value for counterbalancing the weight, this control system including pressure relief valve means and pressure meter means associated with the pressure cushion, the pressure relief valve means being operable before setting of the fluid pressure value for release of pressure from the pressure cushion, the pressure meter means accurately detecting the pressure in the pressure cushion in a measuring range including a predetermined value, actuating means for initiating the setting of a fluid pressure value for counterbalancing the weight, the pressure relief valve means being responsive to the actuating means for operation thereof, and supply valve means and discharge valve means for supplying and discharging compressed fluid to and/or from the cylinder-piston unit means, the supply and discharge valve means being responsive to the actuating means and the pressure meter means for operation thereof.

4,011,810

GARBAGE DISPOSAL UNIT

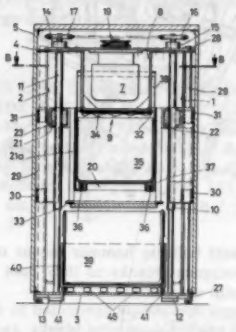
Blaz Santic, Burgau, Germany, assignor to Karl Mengele & Sohne, Gunzberg, Germany

Filed Dec. 23, 1975, Ser. No. 643,870

Claims priority, application Germany, Dec. 23, 1974, 2461242

Int. Cl.² B30B *7/02, 15/06*

U.S. Cl. 100—229 A **9 Claims**



1. A garbage disposal unit comprising frame means defining said disposal unit with an upper end and a lower end, a stationary compacting piston fixedly mounted to said frame means near the upper end of said disposal unit, a stationary receptacle member mounted near the lower end of said disposal unit, a combination piston-receptacle member movably mounted intermediate said stationary piston and said receptacle member, means mounting said combination member for vertical movement within said disposal unit to effect compaction of material contained within said combination member by said piston and compaction of material contained within said receptacle member by said combination member, said piston, said combination member and said receptacle member being configured for nesting interfitting relationship therebetween, and drive means for driving said combination member between operative engagement with said piston and said receptacle member.

4,011,811

MULTIPLE DOCUMENT PRINTING SYSTEM

Robert D. Kodis, Brookline, Mass., assignor to Di/An Controls, Inc., Boston, Mass.

Filed Oct. 20, 1975, Ser. No. 623,566

Int. Cl.² B41J *3/24*

U.S. Cl. 101—93.07 **12 Claims**

1. A system for simultaneously printing as least two document blanks, said system comprising:

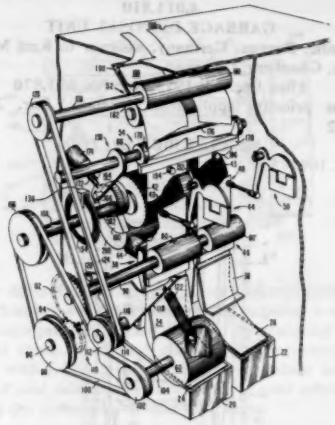
a. a motor;

b. cylindrical print drum means rotated by said motor, said print drum means having at least two sets of characters disposed in rows and arcuate columns about the periphery thereof;

c. ballistic hammer means for each said set of characters, a first print station located between one of said set of characters and one of said ballistic hammer means, a second print station located between the other of said set of characters and the other of said ballistic hammer means, said first and second print stations juxtaposed along a line that is parallel to the rotational axis of said print drum

means, said first print station receiving one of said document blanks, said second print station receiving the other of said document blanks;

d. feed means operatively connected to said motor for independently advancing each said document blank into and through its respective print station, said print drum



means and said ballistic hammer means cooperating to print said document blanks as they pass through their respective print stations;

e. severing means operatively connected to said motor for severing said printed document blanks; and

f. dispensing means operatively connected to said motor for dispensing said severed printed document blanks.

4,011,812

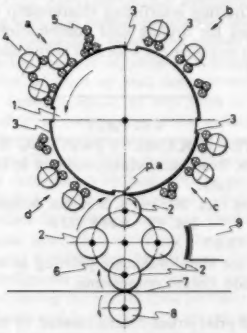
MACHINE FOR PRINTING DIFFERENT COLORS SIMULTANEOUSLY BY THE OFFSET METHOD

Manuel Julian Lecha, Mallorca 49, Barcelona, Spain

Continuation of Ser. No. 301,247, Oct. 26, 1972, abandoned. This application May 31, 1974, Ser. No. 475,246

Int. Cl.² B41F 5/16

U.S. Cl. 101—176 **3 Claims**



1. A machine for printing a plurality of colors by the offset method, said machine comprising:

a single sectored plate cylinder, means to mount said single sectored plate cylinder to rotate at a predetermined circumferential speed, said plate cylinder having equally spaced around the periphery thereof a plurality of equal length zones, each of said zones having fixed thereto an ink receiving sector, each of said sectors having associated therewith separate individual arrangements of ink and water fountains and rollers for a separate of said plurality of colors, means for moving each of said fountain and roller arrangements into contact with only a predetermined one of said sectors to apply thereto the separate color thereof;

a plurality of rubber printing cylinders, the circumferential length of each of said printing cylinders being equal to the length of each of said sectors of said plate cylinder;

a rotatable support mounting at equal angles around the periphery thereof said plurality of printing cylinders, means for incrementally rotating said support to sequentially bring each of said printing cylinders to a first position to be in contact with said sectors of said plate cylinder and thereafter to a second position to be in contact with a surface to be printed; and

means to rotate each of said printing cylinders at a first circumferential speed in said first position and at a second circumferential speed in said second position.

4,011,813

LABEL DISPENSING AND APPLYING APPARATUS

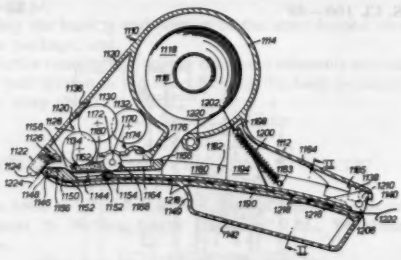
Bernard Sams, London, England, assignor to Norprint Limited, England

Division of Ser. No. 283,212, Aug. 23, 1972, Pat. No. 3,890,188. This application May 20, 1975, Ser. No. 579,139

Claims priority, application United Kingdom, Aug. 25, 1971, 39850/71; Jan. 29, 1972, 4305/72

Int. Cl.² B41F 1/08

U.S. Cl. 101—288 **8 Claims**

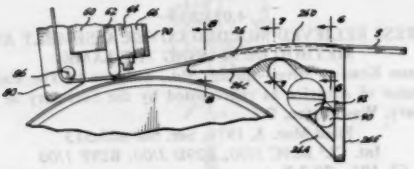


1. In a label applicator, a casing, a label-carrying web store mounted on said casing, a print head assembly mounted within said casing for printing labels withdrawn from said store, means adjacent said print head assembly for detaching a label printed by said print head assembly from the web, a first member having barbs thereon and a platen surface which serves to support a label during the printing operation, said first member being movable relative to said casing and arranged to have its barbs engage the web, a second member having barbs thereon and mounted for limited pivotal movement relative to said casing, and actuating means operable to actuate said first barbed member in one direction to draw a fresh length of web over the barbs of said second barbed member during a first part of a working cycle, and to bring a label carried by said first member into contact with said print head assembly to print that label, said first barbed member being movable in the opposite direction during the second part of the working cycle, causing the fresh length of web to engage the barbs of said second barbed member, and draw a length of web from said store equal to one label length and simultaneously detach the label printed during the first part of the working cycle from the web by passage of the web over said detaching means.

4,011,814
PRINT STOCK GUIDE FOR IMPACT PRINTERS

Kenneth G. Real, Redmond, Wash., assignor to Interface Mechanisms, Inc., Mountlake Terrace, Wash.

Filed Nov. 13, 1975, Ser. No. 631,744
Int. Cl.² B41F 1/08
U.S. Cl. 101—288 11 Claims

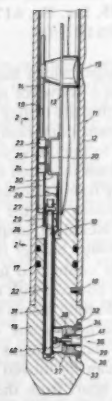


7. A guide means for aligning an elongated strip of print stock with respect to a print station of an impact printer, the elongated strip having a front surface and a back surface and being longitudinally moved in a predetermined direction to and from the print station by a print stock drive means, said guide means comprising a body having a base portion including means for permitting said guide means to be secured to the impact printer, and further having a guide portion upstanding from the integral with said base portion, said guide portion having a guide surface with first and second ends, either the front surface or the back surface of the elongated strip traversing said guide surface from said second end to said first end when moved by the print stock drive means in the predetermined direction when said guide means is secured to the impact printer, said guide surface at said first and said second ends being substantially planar, said guide surface at said second end having a predetermined angle of inclination with respect to a planar surface parallel to said substantially planar first end, said predetermined angle of inclination differing from zero, and said guide surface uniformly decreasing said angle of inclination from said second end to said first end in a direction of said guide surface parallel to the predetermined direction of elongated strip movement.

4,011,815
SAFE-HANDLING ARMING APPARATUS FOR PERFORATING GUNS

Jose B. Garcia, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,693
Int. Cl.² F42C 15/00
U.S. Cl. 102—20 16 Claims



5. Apparatus comprising:

a hollow body having an access opening cooperatively arranged therein;

explosive means including a charge-detonating explosive train in said body and having a receptor explosive and a selectively-initiatible donor explosive adapted for detonating said receptor explosive;

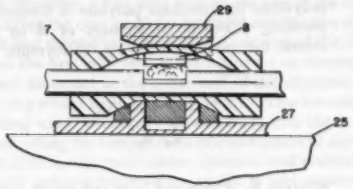
explosive-arming means in said body and selectively operable when said access opening is uncovered for alternatively establishing said charge-detonating train either in an armed operating status where initiation of said donor explosive will be effectual for detonating said receptor explosive or in a disarmed operating status where initiation of said donor explosive will be ineffectual for detonating said receptor explosive; and

status-indicating means operable when said access opening is covered for providing a visual indication exterior of said body representative of at least one operating status of said charge-detonating explosives.

4,011,816
CONTINUOUS LINE CONFINED DETONATING FUSE TO PROVIDE A SERIES OF WORK PULSES (U)

Vernon L. Smith, and Jack F. Hecht, Sr., both of Santa Cruz, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1971, Ser. No. 187,135
Int. Cl.² C06C 5/00; F42B 3/10
U.S. Cl. 102—27 R 9 Claims



1. A detonating fuse comprising:

a. a continuous line of metal encased secondary explosive covered with at least one layer of covering means;

b. at least one segment of said covering means being removed from said fuse thereby exposing said metal;

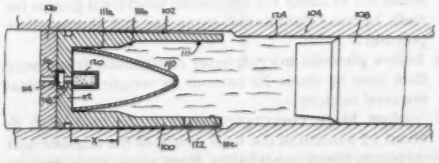
c. at least one detonation confining means positioned over said at least one segment, said confining means consisting of a molded elastomeric segment located and encompassing said removed segments of said coverings; whereby

d. detonation of said fuse causing said at least one detonation confining means to expand outward and retain gases within said at least one segment produced by said detonation.

4,011,817
LIQUID PROPELLANT WEAPON SYSTEM

Eugene Ashley, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed May 7, 1975, Ser. No. 575,283
Int. Cl.² F42B 5/16, 9/14
U.S. Cl. 102—38 19 Claims



1. A round of ammunition comprising:

a projectile having a first average density;
a cavity generator having a second average density; and
a charge of liquid propellant having a third average density which is greater than said second average density;
said charge of liquid propellant being disposed between said projectile and said cavity generator;
said generator being adapted to enter into said charge and form a cavity in the aft portion of said charge which is aft of said generator.

4,011,818
WARHEAD EXPLOSIVE LINER

Max J. Stosz, Jr., Ellicott City, and Harold F. Eccleston, Jr., Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1976, Ser. No. 672,697
Int. Cl.² F42B *13/00*
U.S. Cl. 102—56 R **14 Claims**

1. In a warhead having a casing, a liner covering the inner surface of the casing, and a rubbery, plasticized explosive within the casing, the improvement comprising:

using as said liner a two layer composite comprising:
A. a first layer composed of a filled polyurethane elastomer formed by curing a mixture comprising:
1. a hydroxy-terminated polydiene intermediate polymer wherein:
a. the polydiene chain of the hydroxy-terminated polydiene intermediate polymer is formed by polymerizing 1,3-diene monomers of 4 to 6 carbon atoms, the monomers having the formula:

$$CH_2=C-C=CH_2$$
$$\quad\quad |\quad\quad |$$
$$\quad\quad R_1\quad R_2$$

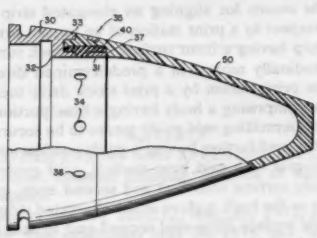
wherein R_1 is selected from the group consisting of —H, $-CH_3$ and $-CH_2CH_3$ and R_2 is selected from the group consisting of —H and $-CH_3$, provided that when R_1 is $-CH_2CH_3$, R_2 is —H, and wherein the polydiene chain may be of either a single monomer type or a mixture of different monomer types of the above formula;
b. the polydiene chain of the hydroxy-terminated polydiene intermediate polymer has a cis-1,4-type of unsaturation content of from 10 to 30 percent, a trans-1,4-type of unsaturation content of from 40 to 70 percent, and a vinyl (1,2)-type of unsaturation content of 10 to 30 percent;
c. the hydroxy-terminated polydiene intermediate polymer has an average of from about 1.8 to about 2.5 predominantly primary, terminal allylic hydroxy groups per average molecule; and
d. the average molecular weight of the hydroxy-terminated polydiene intermediate polymers is from about 1,000 to about 5,000;
2. a hydrocarbon process oil, wherein the weight of hydrocarbon process oil used is from more than zero to about 4 times the weight of hydroxy-terminated polydiene intermediate polymer used;
3. a diisocyanate in an amount sufficient to supply from about 0.7 to about 1.3 isocyanate functional groups for each hydroxy functional group on the intermediate polymer;
4. hollow phenolic microspheres constituting from more than zero to about 20 percent by weight of the total uncured mixture;
5. carbon black constituting from more than zero to about 15 percent of the total weight of the mixture; and
6. asbestos fibers constituting from more than zero to about 8 percent of the total weight of the mixture;

B. a second layer composed of a hard, solvent-resistant epoxy-polyamide;
the first layer covering the inner surface of the warhead casing and the second layer covering the inner surface of the first layer.

4,011,819
STRESS RELIEVED MOLDED COVER ASSEMBLY AND METHOD OF MAKING THE SAME

Hyman Kessler, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1976, Ser. No. 663,313
Int. Cl.² B29C *5/00*; B29D *3/00*; B29F *1/00*
U.S. Cl. 102—70.2 P **11 Claims**



1. A stress-relieved, molded hollow cover, comprising:
A support ring having a marginal recess area;
An elastomer band disposed within said marginal recess surrounding a portion of said support ring;
A hollow portion of thermoplastic material injection molded directly about and enveloping the band of elastomer, interlocked with said ring and axially extending from said ring, said hollow portion cooperating with said ring to form said hollow cover.

4,011,820
METHOD AND MEANS FOR STABILIZING AND POSITIONING A TROLLEY HANGER RELATIVE TO A CONVEYOR RAIL

Joseph Heber Bordenave, South San Francisco, and Robert Falls, Millbrae, both of Calif., assignors to The Cincinnati Butchers' Supply Company, Cincinnati, Ohio

Filed Sept. 26, 1975, Ser. No. 617,009
Int. Cl.² B61B *3/00*
U.S. Cl. 104—97 **28 Claims**

1. For use with a trolley hanger which has a rail engaging wheel adapted to be landed on a conveyor rail, and a trolley hanger engaging frame connecting the trolley wheel to a hoisting mechanism, a stabilizer means comprising:
mounting means connected to the conveyor rail; and
a trolley hanger engaging means mounted on said mounting means so that the engaging frame is located between said trolley hanger engaging means and the rail, said trolley hanger engaging means including abutting means for abuttingly engaging the trolley hanger frame, said abutting means being pivotally connected to said mounting frame to be approximately co-level with the rail, actuator means for actuating said abutting means mounted on said mounting means, said linking means connecting said abutting means to said actuating means in a manner so that said abutting means can be moved from a normal, retracted position spaced apart from the rail a distance sufficient to allow free movement of the trolley when same is located between said abutting means and the rail

into a stabilizing position when the wheel is hoisted above the rail by the hoisting mechanism with said abutting

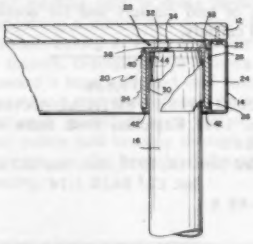
means holding the trolley frame in a position to land the trolley wheel on the rail.

4,011,821

TABLE

Jerry L. Neal, Columbus, Ind., assignor to Cosco, Inc., Columbus, Ind.

Filed Oct. 29, 1975, Ser. No. 626,990
Int. Cl.² A47B *3/06*
U.S. Cl. 108—156 **10 Claims**



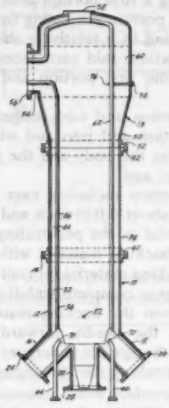
1. In combination, a table comprising a generally planar top unit, a plurality of legs, a plurality of sockets each having a sleeve connected to said top unit with its central axis generally normal to the plane of said top unit and an elastomeric bushing received within said sleeve and shaped for snug reception of one end of one of said legs, said bushings each having a radially inwardly extending upper face at the upper end thereof to limit upward leg movement therein, each of said bushings also having tabs extending radially outwardly from said upper face and radially outwardly extending flange means at the lower end thereof for respective reception over and engagement with the upper and lower extents of the associated sleeve to limit bushing movement within said sleeve, and a clip mounted on the underside of said top unit and having a plurality of recesses formed therein for receiving said plurality of legs, said plurality of legs being selectively and alternately receivable in said sockets for placing the table in an upright condition and in said clip for placing the table in a knocked-down condition.

4,011,822

BURNER FOR DECARBONIZING ORGANIC CHAR

Charles K. Choi, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Aug. 11, 1975, Ser. No. 603,873
Int. Cl.² F23D *1/00*
U.S. Cl. 110—28 R **7 Claims**



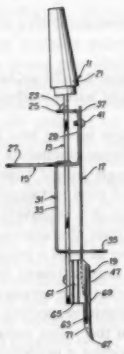
1. A burner for decarbonizing char comprising an elongated combustion chamber; a first inlet pipe at one end of the chamber for directing the char particles into said combustion chamber; at least one second inlet pipe at said one end of the chamber adjacent the first inlet pipe for directing an air stream into the chamber; an outlet at the other end of the chamber; and water injecting means including fogging means for introducing and dispersing water in a finely divided state into the second inlet for controlling the temperature of combustion of the char in the air stream in said combustion chamber and maintaining a substantially uniform temperature profile in said combustion chamber.

4,011,823

TUFTING TOOL FOR EVEN STITCHING

George L. Houghton, Santa Ana, and Fred F. Fredensberg, Long Beach, both of Calif., assignors to Rug Crafters, Santa Ana, Calif.

Filed Jan. 30, 1976, Ser. No. 653,926
Int. Cl.² D05C *15/06*
U.S. Cl. 112—80 **11 Claims**



1. A tufting tool comprising:
an elongated body;
a shuttle mounted on said body for reciprocating movement relative to said body;

an elongated resilient plunger attached to said shuttle for movement with said shuttle;

a needle mounted on said body adjacent one end of said body, said needle having a yarn receiving passage and a plunger receiving passage with the plunger receiving passage being adapted to receive at least a portion of the plunger;

said needle including a first portion attached to the body and a penetrating portion projecting from said first portion and terminating in a relatively sharp point remote from said first portion, said yarn receiving passage extending through the first portion and the penetrating portion;

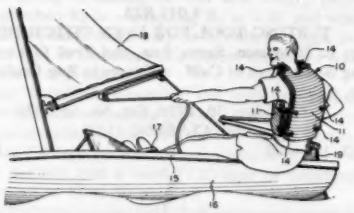
said penetrating portion and said resilient plunger being adapted for insertion and into and withdrawal from a backing material as the body and the plunger are relatively reciprocated; and

said penetrating portion including cam means having a throw of at least about 0.020 inch and cooperable with the backing material as the penetrating portion is withdrawn from the backing material with the plunger remaining in the backing material for resiliently loading the plunger so that upon complete withdrawal of the penetrating portion from the backing material the plunger resiliently moves the needle forward relative to the plunger whereby the needle undergoes a controlled advancing movement along the backing material.

4,011,824
COMPETITION SAILING JACKET

Margaret Kaynor; Peter Branning, and Bruce Nolan, all of Miami, Fla., assignors to Florida Sailing Systems, Inc., Miami, Fla.

Filed Dec. 10, 1975, Ser. No. 639,419
Int. Cl.² B63B *9/08*
U.S. Cl. 114—270 **9 Claims**



1. A competition sailing weight jacket providing a desired predetermined trim weight when wetted, said jacket comprising, in combination:

at least one vest section having two substantially identical layers, each of said layers including substantially identical inner and outer panels joined together along their margins to form interior compartments, at least one of said panels being formed of a relatively loosely woven fabric allowing water to pass therethrough, said layers being joined together along at least a portion of their margins to form an additional compartment therebetween;

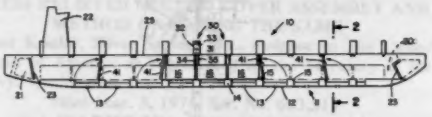
first and second blanket-like masses of water absorbent material disposed within respective ones of said compartments, the weight of the water capable of being absorbed by said masses providing a predetermined portion of said desired predetermined trim weight, said inner panels being cross-stitched to respective ones of said outer panels to hold said water absorbent material in position; and

fastening means for securing said vest section to the body of a user.

4,011,825
SWASH PLATE

William Everett Kirby, Victoria, Hong Kong, and David Jackson Seymour, Daly City, Calif., assignors to Wharton Shipping Corporation, Panama, Panama

Continuation-in-part of Ser. No. 583,440, June 3, 1975, abandoned. This application Apr. 20, 1976, Ser. No. 678,623
Int. Cl.² B63B *25/00*
U.S. Cl. 114—260 **20 Claims**



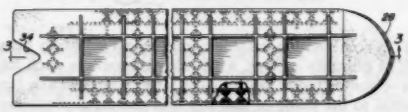
1. In a waterborne vessel having a hull with rigid supporting and hull-reinforcing structure, a bow, a stern, and sidewalls providing a series of buoyancy compartments and a hollow interior defining at least one hold, means communicating between said hold and the sea water for enabling free passage of water into and out of said hold at all times and having gate means for flotation loading thereof, so that said hold is partially flooded, said vessel being for transport of a plurality of buoyant cargo carriers such as barges, lighters and pontoons placed by flotation loading through said gate means into predetermined locations within said hold, wherein each said carrier is partially supported by its own buoyancy and is also so connected to the vessel as to enable exchange of buoyancy between said carrier and said vessel and wherein the number of said predetermined locations may exceed the number of carriers placed in the hold on a given voyage, the improvement comprising:

movable swash blockage means secured within said hold for movement into a carrier-protecting position extending across substantially the entire width of said hold for protecting said carriers by impeding the slosh of flood water accumulated within said hold which may be induced by pitching and other motion of said vessel and for movement into a stowed position during flotaion loading and unloading of said carriers and for accommodation of additional carriers.

4,011,826
MARINE VESSEL WITH VERTICAL ANNULAR WALLS

Alfred A. Yee, 1441 Kapiolani Blvd. Suite 810, Honolulu, Hawaii 96814

Filed Nov. 14, 1975, Ser. No. 632,076
Int. Cl.² B63B *5/14*
U.S. Cl. 114—65 A **11 Claims**



1. A marine vessel for storage, support or transportation of material comprising a continuous rigid exterior peripheral wall, a continuous rigid bottom wall connected to and extending between the lower portions of said peripheral wall to define an enclosure, a plurality of rigid annular walls connected to and extending axially upward from said bottom wall to define a plurality of compartments separate from each other, a rigid top wall connected to said peripheral wall, and at least one intermediate wall generally paralleling said top and bottom walls and being disposed in adjacent spaced relation to one of said walls, certain of said annular walls extending rigidly between the intermediate wall and the adjacently related top or bottom wall, said rigid annular walls, peripheral wall, top and bottom walls and intermediate wall being of integral

cementitious construction with the annular walls being rigidly connected with each other and the other wall forming the enclosure, said annular walls being cylindrical.

4,011,827

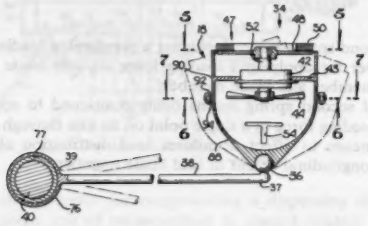
MACHINE FOR CLEANING THE BOTTOM OF BOATS

Ben Fond, 13955 Tahiti Way, Marina del Rey, Calif. 90291

Filed Jan. 12, 1976, Ser. No. 648,208

Int. Cl.² B63B *59/00*

U.S. Cl. 114—222 **10 Claims**



5. A boat hull cleaning apparatus comprising:

a. a plurality of brushing devices each disposed within an associated housing and coupled to a supporting structure, each housing being located below the surface of a body of water when in normal use, each said brushing device having a rotatable base member with a plurality of cleaning surfaces extending outwardly therefrom such that substantially all said cleaning surfaces lie in a common plane, said base member having an opening so as to permit water to pass therethrough;

b. motor means disposed within each associated housing and coupled to an associated brushing device for positioning and rotating said brushing device, said motor means comprising a motor and an associated rotatable shaft, said shaft having at least one blade disposed at a front end thereof, configured for moving said brushing devices toward a boat hull, and said base member disposed at a second end thereof, said housing having an opening adjacent said blade such that as said blade rotates, water enters said housing through the opening in said base member and is forced out through the opening in said housing.

4,011,828

RESPIRATORY SIGNALLING DEVICE

Geoffrey Donald Black, Sawbridgeworth, England, assignor to The Medishield Corporation Limited, London, England

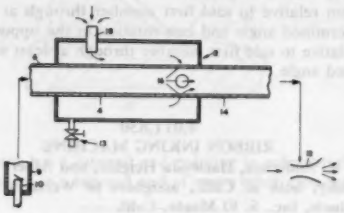
Filed Oct. 1, 1975, Ser. No. 618,356

Claims priority, application United Kingdom, Oct. 1, 1974, 42625/74

Int. Cl.² A62B *7/00*; **G01L** *19/12*

U.S. Cl. 116—70 **6 Claims**

1. In a signalling device for an artificial respirator the combination comprising: a chamber, an outlet in one wall of said chamber adapted to be connected to an aspirator, means defining first and second inlets communicating with the interior of said chamber, fluid flow responsive acoustic signalling means operably connected with one of said first and second inlets and interconnecting the interior of said chamber with said signalling means, shroud means connected to the other of said inlets, a gas pressure responsive expiratory valve selectively connecting the interior of said shroud to an intermittent gas pressure source whereby operation of said expiratory



valve in response to variations in said intermittent gas pressure from said source intermittently operates said signalling device.

4,011,829

CLOSURE HAVING INDICATING MEANS

Doris Beryl Wachsmann, 1666 Malvern Road, Glen Iris, Victoria 3146, and Reginald Francis Thomas, Taradale Garage, Calder Highway, Taradale, Victoria 3447, both of Australia

Filed Sept. 24, 1975, Ser. No. 616,303

Claims priority, application Australia, Oct. 1, 1974, 9102/74; Nov. 19, 1974, 9663/74; Apr. 8, 1975, 1159/75

Int. Cl.² G09F *9/00*

U.S. Cl. 116—121 **8 Claims**

1. A counting screw cap for a container comprising three members arranged for rotation relative to one another, the first of said members being provided with an internal screw thread for engagement with a complementary screw thread on the neck of the container, the second of said members being arranged to be manually grasped for removing the cap from the container and replacing it on the container, there being provided a lost motion drive between said first and second members whereby said second member is enabled to rotate through a predetermined angle in each direction without causing rotation of said first member while rotation of the second member beyond the predetermined angle causes rotation of the first member to screw the latter onto, or remove it from, the neck of the container, the third member being interposed between the first and second members in such manner that it is driven by the second member during a substantial part of the lost motion rotation of the second member relative to the first member in one direction and restrained against motion by the first member during a substantial part of the lost motion rotation of the second member relative to the first member in the opposite direction, a series of numbers marked on one of said members at an angular spacing slightly less than said predetermined angle, and indicating means associated

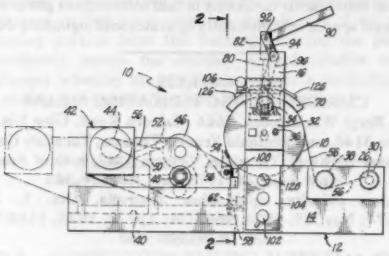
with one of said members other than the one on which said numbers are marked, one of said member carrying said numbers and said member having indicating means being said third member, and said indicating means in co-operation with said numbers indicating the number of times said second member has been caused to perform a cycle of one rotation in one direction relative to said first member through at least said predetermined angle and one rotation in the opposite direction relative to said first member through at least said predetermined angle.

4,011,830

RIBBON INKING MACHINE

Frank R. Anderson, Hacienda Heights, and Albert J. Castro, Cudahy, both of Calif., assignors to Westates Space-Era Products, Inc., S. El Monte, Calif.

Filed May 12, 1975, Ser. No. 576,599
Int. Cl.² B05C *1/08, 9/14*
U.S. Cl. 118—60 **6 Claims**



1. In a ribbon inking machine having a frame, a drum mounted on said frame, a carriage movably mounted on said frame so as to be capable of being moved towards and away from said drum, a ribbon feeding means mounted on said carriage, ribbon inking means mounted on said carriage, and ribbon takeup means mounted on said frame the improvement which comprises:

guide rod means located adjacent to said drum,

a pressing element mounted on said guide rod means so as to be capable of being moved on said guide rod means towards and away from said drum,

flexible band means located on said pressing element so as to extend around said guide rod means,

tightening means for tightening said band means relative to said guide rod means so as to position said pressing element in a desired position with respect to said guide rod means, and

mechanical means for moving said pressing element with respect to said drum and said guide rod means, said mechanical means being capable of being used to space said pressing element away from said drum.

4,011,831

OIL METERING BLADE LOADING ASSEMBLY

Oskar J. Braun, Williamson, and Thomas A. Rengert, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1975, Ser. No. 626,905
Int. Cl.² B05C *11/04*
U.S. Cl. 118—60 **2 Claims**

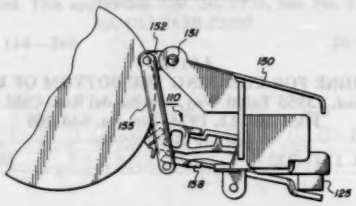
1. In an oil wetted heated pressure roll fusing apparatus for fusing toner images to copy sheets produced from a xerographic copying machine, an improved oil metering blade assembly comprising:

a frame;

a blade assembly positioned on said frame including a blade holding member mounted on pin means which is pivotable on said frame,

first spring means for engaging said pin means for positioning said assembly in said frame,

a blade member supported by said blade holding member in contact with an oil wetted fuser roll surface to effect a uniform oil film thereon,



second spring means including a pressureing loading member for applying a loading force on said blade holding member and blade member,

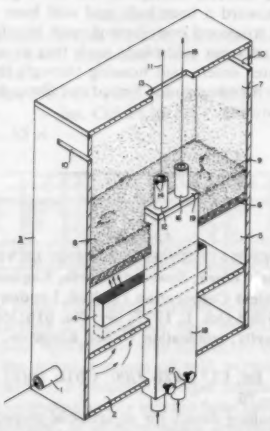
said second spring means being positioned to apply said loading force at a single point on an axis through said pin means to effect a uniform load distribution along the longitudinal extent of said blade member.

4,011,832

BUILD CONTROL FOR FLUIDIZED BED WIRE COATING

Dean C. Westervelt, Acme, Pa., and Robert E. Pierce, Abingdon, Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1975, Ser. No. 553,201
Int. Cl.² B05C *11/16*
U.S. Cl. 118—301 **15 Claims**

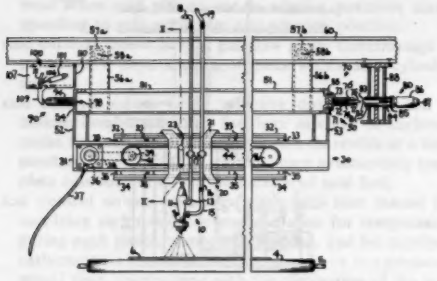


1. In an apparatus for coating an elongated member with an aerated powder by passing said elongated member through said aerated powder, build control means for controlling the build of said powder on said elongated member, said build control means comprising a barrier which at least partially shields only a portion of an outside cross-sectional perimeter of said elongated member from said aerated powder.

4,011,833
RECIPROCATING DEVICE HAVING VIBRATION REDUCING MEANS

Charles T. Hawkins, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 411,952, Nov. 1, 1973, Pat. No. 3,937,092, which is a division of Ser. No. 229,385, Feb. 25, 1972, Pat. No. 3,796,184. This application Aug. 18, 1975, Ser. No. 605,475
Int. Cl.² B05B *3/00*
U.S. Cl. 118—323 **14 Claims**



1. In an apparatus for reciprocating a dispensing device along a given axis of reciprocation in spaced relation to a substrate, wherein the apparatus is of the type having means for supporting the substrate; means connected to the dispensing device for imparting accelerating and decelerating forces to the dispensing device and a reciprocating motion to the dispensing device along the given axis of reciprocation; and means for supporting the dispensing device in facing relation to the substrate; the improvement comprising:

oscillating means;

means for mounting said oscillating means for movement along a path substantially parallel to the given axis of reciprocation;

means operatively connected to said oscillating means and to the reciprocating motion imparting means for transferring substantially all of the accelerating and decelerating forces associated with the reciprocation of the dispensing device to said oscillating means so as to oscillate said oscillating means along the path substantially parallel to the given axis of reciprocation of the dispensing device and substantially opposite to the motion of the dispensing device; and

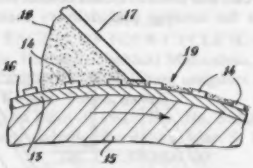
shock absorbing means for countering the motion of said oscillating means produced by the accelerating and decelerating forces associated with the reciprocation of the dispensing device.

4,011,834
TOUCHDOWN ELECTROSTATIC DEVELOPMENT APPARATUS

Craig H. Stephan, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1975, Ser. No. 618,870
Int. Cl.² G03G *15/08*
U.S. Cl. 118—653 **7 Claims**

1. An electroscopic-developer donor member comprising a surface, and having adhered on its surface a plurality of raised, discrete microelements having vertically essentially straight sides, the ratio of length to width of said microelements being greater than one, at least one end of each element being tapered to resemble a wedge as seen in horizontal cross-section, the elements being so oriented on said donor surface that

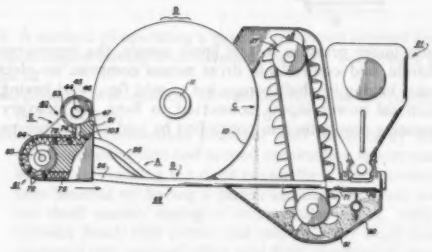


each element has a tapered end pointing in substantially the same direction as a tapered end of every other element.

4,011,835
TONER CONVEYOR

William G. Lewis, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 25, 1976, Ser. No. 689,752
Int. Cl.² G03G *15/00*
U.S. Cl. 118—652 **9 Claims**



1. In an apparatus for returning the residual toner remaining on a photoconductive surface after image transfer to a remote developer station for reuse in the xerographic developer process wherein residual particulate toner is removed from the photoconductive surface at a cleaning station, collected by a collection means, and returned by a tubular conduit connecting said collection means and the developer station, an endless conveyor means arranged to be driven sequentially through said tubular conduit past said collection means and developer station, the improvement in which said endless conveyor means comprises an endless helical spring means and a plurality of floats nested in said spring means for pushing developer along said tubular conduit.

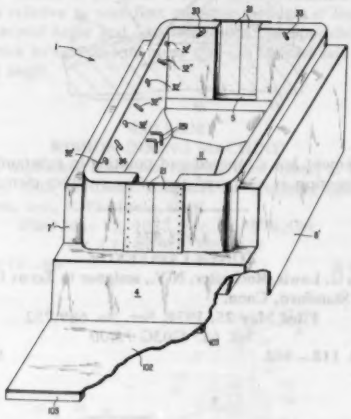
4,011,836
PET COMMODE

Franklin Temel, 1050 NE. 91st Terrace, Miami Shores, Fla. 33138

Filed Sept. 22, 1975, Ser. No. 615,493
The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **8 Claims**

1. In a pet commode including: a housing having a bottom provided with an outlet passage; means located in said housing and defining a floor for supporting a pet and receiving its bodily waste products, said floor being mounted for pivotal movement about a substantially horizontal axis for permitting waste products deposited on said floor to fall onto said housing bottom surface; water spray means located in said housing for directing water sprays against said floor, whereby the surface of said floor which receives waste products is struck by such sprays when said floor undergoes such pivotal move-

ment; controllable water delivery means connected to said spray means for delivering water thereto; controllable drive means connected to said floor for imparting such pivotal movement thereto; and control means connected to said water delivery means for causing said delivery means to deliver



water under pressure to said spray means, the improvement wherein said controllable drive means comprise an electric motor having its shaft connected to said floor and having its electrical power inputs connected to have the delivery of operating power thereto controlled by said control means.

4,011,837

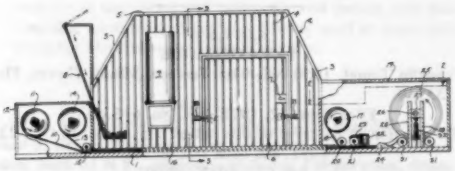
SELF-CLEANING ANIMAL KENNEL

Leo P. Ksioszk, N98 W15754 School Road, Germantown, Wis. 53022

Continuation-in-part of Ser. No. 550,964, Feb. 19, 1975, abandoned. This application Nov. 26, 1975, Ser. No. 635,688

Int. Cl.² A01K *1/02*

U.S. Cl. 119—1 **9 Claims**



7. An apparatus for collecting and disposing of animal waste, comprising a base structure, an impervious sheet disposed on the base and adapted to receive waste from an animal, said sheet being mounted for movement across the base, means for applying a sheet of absorbent material to the upper surface of the impervious sheet to cover said waste and provide a composite sheet structure, deodorizing means for applying a deodorizing material to the outer surface of the absorbent sheet, edge folding means for folding the side edges of the composite sheet structure inwardly, and winding means for winding the composite sheet structure into coiled form.

4,011,838

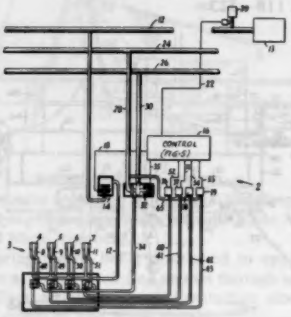
ELECTRONIC MILKER

Sven-Ake Nordegren, Soedertelje, Sweden, and Douglas J. Norton, Red Hook, N.Y., assignors to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 25, 1976, Ser. No. 670,112

Int. Cl.² A01J *5/04*

U.S. Cl. 119—14.08 **18 Claims**



1. A milking machine system comprising:

a cluster of teat cups having teat-receiving liners;

a milk line for receiving milk from the cluster;

a flow rate sensing device associated with the milk line for sensing the rate of milk flow within the line;

a timing device for measuring lapses of predetermined periods of time;

first vacuum means connected to the milk line for creating a working vacuum in the teat cups;

second vacuum means connected to the teat cups for creating a massage vacuum;

pulsator means associated with the teat cups for creating periodic pulses of the massage vacuum; and

system control means operatively connected to the flow rate sensing device and to the timing device for controlling the character of the working and massage vacuums applied to the teat cups in response to the rate of milk flow within the milk line and in response to the lapses of the predetermined periods of time.

4,011,839

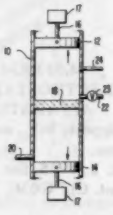
METHOD AND APPARATUS FOR PROMOTING COMBUSTION IN AN INTERNAL COMBUSTION ENGINE USING A CATALYST

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.Y.

Division of Ser. No. 256,432, May 31, 1972, Pat. No. 3,923,011. This application Nov. 28, 1975, Ser. No. 636,022

Int. Cl.² F02B *75/12*

U.S. Cl. 123—1 R **7 Claims**



1. In an internal combustion engine including a cylinder, piston means arranged for reciprocation within the cylinder and cooperating therewith to define a compression zone which is compressed as the piston means moves in a compres-

sion stroke from a minimum compression position to a maximum compression position, inlet means for supplying combustion-oxygen-bearing air and carbonaceous fuel to the cylinder, and exhaust means for exhausting combustion product gas from the cylinder, the improvement comprising:

first and second pistons forming said piston means and operatively disposed in opposed relationship along said cylinder to define said compression zone between said pistons;

oxidation catalyst means disposed in said cylinder between said pistons at a location which is within the compression zone when said pistons are in relative positions corresponding to said maximum compression position,

said catalyst means having gas flow paths therethrough to permit flow therethrough of gases within said cylinder, and

said catalyst means being effective during operation to initiate combustion of a fuel-lean mixture of carbonaceous fuel and air passing in contact therewith at a temperature below 3,500° F with resultant substantially complete combustion to carbon dioxide of said fuel;

and control means associated with said inlet means for supplying air to said compression zone for compression during each piston compression stroke, and for supplyng carbonaceous fuel to the compression zone at a predetermineJ time, cooperating with the disposition of the portion of said inlet means carrying said fuel to the cylinder, to effect contact of said fuel with said oxidation catalyst means at a time commencing with the latter portion of each compression stroke,

said control means being adjustble to supply a sufficient total quantity of air, relative to the quantity of said carbonaceous fuel, to give an air:fuel weight ratio of at least about 20:1 and to provide for passage in contact with said oxidation catalyst means of a fuel-lean combustible air-fuel mixture with a theoretical adiabatic flame temperature in the range of from about 1,800° F to about 3,500° F.

4,011,840

DRIVE SYSTEM FOR A MOTOR VEHICLE

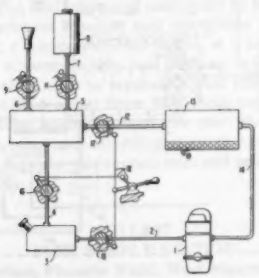
Hans-Joachim M. Forster, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 28, 1975, Ser. No. 572,191

Claims priority, application Germany, Apr. 30, 1974, 2420820

Int. Cl.² F02B *43/08*

U.S. Cl. 123—3 **26 Claims**



1. A drive for a motor vehicle with an internal combustion engine which is supplied with fossil fuels from a fuel tank by way of a fuel line, characterized in that the fuel tank is operatively connected also with a cracking carburetor means from which a line leads to a hydride storage means which, in turn, is operatively connected with the combustion engine, the combustion engine being operable in areas of high traffic density with at least a hydrogen-fuel-gas mixture as well as with a high excess of air whereas, upon shifting over, it can be operated with fossil fuel and with an air ratio number of about 1 on open highways.

4,011,841

GASOLINE ENGINE OF FOUR-CYCLE IGNITION TYPE

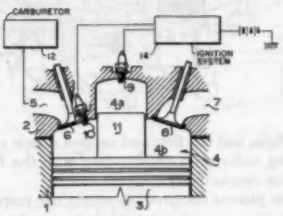
Tadanori Sato, Hachioji; Toshiaki Matsushita, Hino, and Isao Matsuno, Tachikawa, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1975, Ser. No. 555,060

Claims priority, application Japan, Mar. 5, 1974, 49-25451

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 B **10 Claims**



1. A method of operating a gasoline-powered internal combustion engine having a combustion chamber, comprising the steps of

supplying a homogeneous air-fuel mixture into the combustion chamber,

dividing the combustion chamber into temporarily non-communicating first and second combustion spaces starting before reaching top dead center for a predetermined time interval by having a piston assume a position near top dead center, during a compression stroke, with a cylinder head, said piston and said cylinder head being cooperatively stepped, with said first combustion space having a volume smaller than that of said second combustion space; and

igniting by means of a spark plug means located in the first and second combustion spaces the air-fuel mixtures in the first and second combustion spaces, respectively, at different timings during the predetermined time interval when said first and second combustion spaces are non-communicating, thereby effecting combustions of the air-fuel mixtures in the first and second combustion spaces at first and second flame propagation speeds, respectively.

4,011,842

PISTON MACHINE

Francis William Davies, 3366 Whittier Ave., Victoria, B.C., Canada (V8Z 3P9), and Joseph Walcer, 7160 Veyaness Road, Saanichton, B.C., Canada (V0S 1M0)

Filed Sept. 8, 1975, Ser. No. 611,305

Int. Cl.² F02B *75/28*

U.S. Cl. 123—61 R **14 Claims**

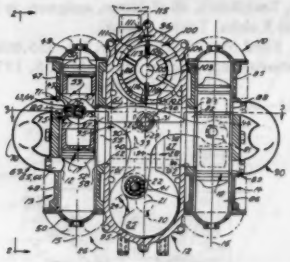
1. A reciprocating piston machine characterized by: a crankcase, a crankshaft having a crankpin and being mounted for rotation relative to the crankcase about a crankshaft axis; first and second spaced parallel cylinders having cylinder axes straddling and disposed normally to the crankshaft axis; first and second pistons mounted for reciprocation within the respective cylinders; inlet and exhaust ports in the respective cylinders; valve means controlling the inlet and exhaust ports and synchronized with the respective pistons to open and close the cylinder ports as required; the machine being further characterized by:

i. a guide means within the crankcase disposed between and parallel to the cylinder axes,

ii. a crosshead complementary to the guide means and

mounted for reciprocation along the guide means, the crosshead having a journal,

iii. a connecting member having a crank connecting arm, first and second piston connecting arms, and a journal to journal the connecting member on the journal of the crosshead, the crank connecting arm journalled on the



crankpin and the first and second piston connecting arms having outer ends cooperating with the first and second pistons respectively,

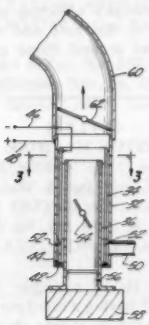
so that the pistons reciprocate within the respective cylinder, the connecting means rotates relative to the crosshead, and the crosshead reciprocates relative to the guide means with rotation of the crankshaft.

4,011,843

VAPORIZED FUEL FOR INTERNAL COMBUSTION ENGINE AND METHOD AND APPARATUS FOR PRODUCING SAME

Arnold I. Feuerman, 5179 Corners Drive, West Bloomfield, Mich. 48033

Filed Feb. 27, 1975, Ser. No. 553,566
Int. Cl.² F02B *51/04*
U.S. Cl. 123—119 E **9 Claims**



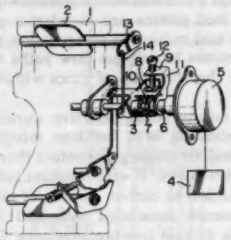
1. An internal combustion engine comprising: a source of electrolytically conductive waterhydrocarbon emulsion; a source of electric current; a vaporizer including means adapted to pass electric current through a quantity of said emulsion to generate a vapor form the emulsion; a combustion chamber; means for introducing the vapor produced by the passage of said electric current through said emulsion into said combustion chamber; means for introducing air into said combustion chamber; and means for igniting the air-vapor mixture.

4,011,844

AUTOMATIC CHOKE VALVE APPARATUS IN AN INTERNAL COMBUSTION ENGINE

Yoshiaki Hirosawa, Tokyo; Toshio Nomura, Niiza, and Masahiko Iiyama, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 16, 1975, Ser. No. 587,383
Int. Cl.² F02M *1/10;* **F02D** *11/08;* **F02M** *23/04*
U.S. Cl. 123—119 F **4 Claims**



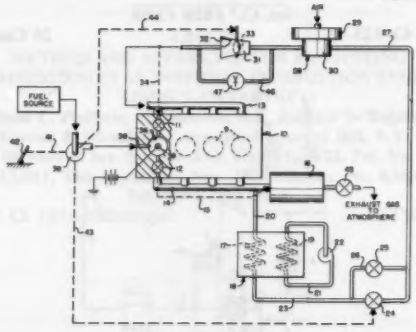
1. In automatic choke valve apparatus for an internal combustion engine in which the degree of opening of a choke valve is selectively controlled by a drive pulse motor drivingly coupled to the valve and a pulse circuit controlling the pulse motor, the improvement wherein said circuit comprises a pulse generator which oscillates at a fixed frequency, and produces an output pulse signal for operation the drive pulse motor, and means coupled to said pulse generator at the output thereof for intermittently controlling the output pulse signal in accordance with engine temperature.

4,011,845

INTERNAL COMBUSTION ENGINE OPERATION UTILIZING EXHAUST GAS RECIRCULATION

Edward A. Mayer, Newburgh, and Donald W. Plungis, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 259,064, June 2, 1972, abandoned. This application Dec. 17, 1974, Ser. No. 533,588
Int. Cl.² F02B *33/00*
U.S. Cl. 123—119 A **6 Claims**



1. In an internal combustion engine having at least one combustion chamber including; exhaust and intake valves communicated therewith, the latter mentioned valve being operable to cyclically admit a preliminary combustion supporting gaseous mixture to said combustion chamber, and an exhaust valve being operable to pass a hot exhaust stream therefrom, and fuel injection means communicated with said combustion chamber being operable to cyclically introduce a stream of fuel to the latter,

conduit means communicating said exhaust valve with said

intake valve to segregate and carry a stream of gas to the latter;

gas mixing means positioned in said conduit means, and being communicated with a source of a combustion supporting medium to intermix the latter with said stream of exhaust gas whereby to form a preliminary gaseous mixture;

first flow regulating means having a by-pass means therein; being positioned in said conduit means at a point down stream of said gas mixing means to receive said preliminary mixture of exhaust gas and combustion supporting medium, said first flow regulating means being connected to said intake valve whereby to controllably regulate the flow of said preliminary gas mixture, passing to said intake valve, and

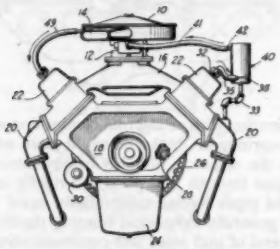
second flow regulating means having by-pass means therein, being disposed in said conduit means upstream of said gas mixture means, and being operable to regulate the flow of said exhaust gas stream subsequent to discharge thereof from said exhaust valve.

4,011,846

ANTI-POLLUTION DEVICE

Joseph F. Gagliardi, Orlando, Fla., assignor to Did-Mor Engineering and Manufacturing Co., Chattanooga, Tenn.

Filed Mar. 24, 1975, Ser. No. 561,551
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **10 Claims**



1. A pollution control device for an internal combustion engine comprising a housing having a first inlet for receiving fluids from an engine crankcase, a second inlet for receiving fluids from an engine exhaust manifold, and an outlet for returning fluids to the engine combustion chambers; a first partition having an opening therethrough mounted within said housing between said inlets and said outlet to separate a fluid mixing compartment adjacent said inlets from a fluid heating compartment; a second partition having at least one aperture therethrough mounted within said housing between said first partition and said outlet to separate a fluid filtering compartment adjacent said outlet from said fluid heating compartment; and a tube having at least one port therein mounted within said housing and extending through said fluid mixing compartment between said second inlet and said first partition opening.

4,011,847

FUEL SUPPLY SYSTEM

Robert D. Fortino, Pinnacle Road, West Monroe, N.Y. 13167

Filed Aug. 23, 1974, Ser. No. 500,074
Int. Cl.² F02M *17/22*
U.S. Cl. 123—134 **4 Claims**

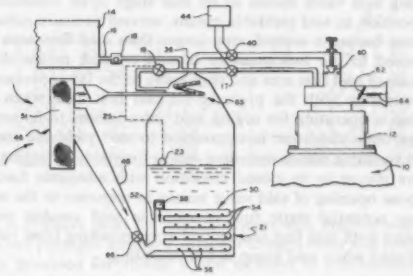
1. An internal combustion engine including a fuel supply system having a tank for liquid fuel and a line for supply thereof to a carburetor adapted to provide an atomized fuel charge to the engine cylinder for combustion therein, said system comprising:

a. an auxiliary tank containing liquid fuel;

b. first and second intake means for atmospheric air;

c. first and second outlet means communicating with said first and second intake means, respectively, and both arranged within said auxiliary tank for escape of the air from said first intake means below the level of liquid fuel and from said second intake means above the level of liquid fuel therein;

d. a vaporized fuel supply line connected between the upper side of said auxiliary tank and the carburetor of the engine, said vaporized fuel supply line including internal means for creating turbulance in the vapor flowing therethrough;



e. first and second valve means movable between fully open and closed positions and respectively arranged in the liquid and vaporized fuel supply lines; and

f. control means actuable to move one of said valve means to the open position and the other of said valve means to the closed position alternately, with each successive actuation of said control means;

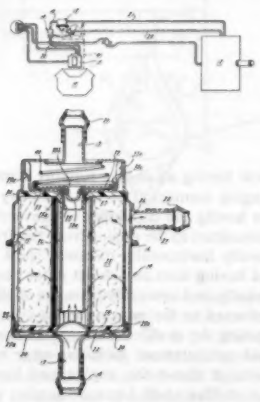
g. an air filter and an air intake valve associated with said second intake means, said intake valve being biased to a normally closed position and movable to an open position to admit air into the upper portion of said auxiliary tank in response to pressure therein falling below atmosphere.

4,011,848

FUEL FILTER AND ROLL-OVER VALVE

Thomas Tucker Coddington, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 15, 1975, Ser. No. 605,098
Int. Cl.² F02M *59/46;* **F16K** *17/36;* **B60K** *28/00*
U.S. Cl. 123—136 **7 Claims**



1. In combination with an automotive vehicle having a fuel tank and an engine, fuel supply conduit means connected with said tank, a fuel pump driven by said engine and located in

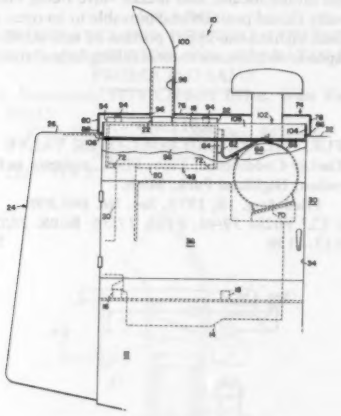
said conduit means for pumping fuel from said tank for use by said engine, means dependent upon operation of said pump to open said fuel conduit means comprising valve means operable at a closed condition to close said conduit means and operable at first and second stage open conditions respectively to provide a comparatively small first stage high resistance opening and a larger second stage low resistance opening for said conduit means, yieldable means normally urging said valve means to its closed condition, first pressure actuated means having a first area exposed to the fuel pressure in said conduit means between said tank and valve means and responsive to the latter pressure when said pump is operating for urging said valve means to its first stage open condition in opposition to said yieldable means, second pressure actuated means having a second area larger than said first area and exposed to the fuel pressure in said conduit means downstream of said first area and responsive to the latter pressure in cooperation with the pressure on said first area when said pump is operating for urging said valve means to its second stage open condition in opposition to said yieldable means, said yieldable means including means for yieldably urging said valve means to its closed condition with adequate force to oppose opening of said valve means in response to the maximum potential static fuel pressure in said conduit means against both said first and second areas resulting from vehicle roll-over when said pump is not operating.

4,011,849

COMBINED ENGINE AND MUFFLER COMPARTMENT

David Dennis Latham, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 5, 1976, Ser. No. 655,519
Int. Cl.² F02B *77/00*
U.S. Cl. 123—198 E **5 Claims**



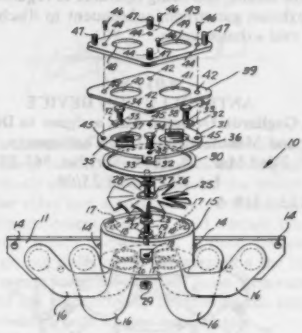
1. In a vehicle having an engine support frame, an internal combustion engine connected to the frame by a plurality of engine mounts having the capability of preventing vibrations from being transmitted to the engine from the frame, a muffler having a generally horizontally disposed shell spaced above the engine and having inlet and outlet pipes respectively projecting downwardly and upwardly from the shell with the inlet pipe being conneted to the engine, and a compartment substantially enclosing the muffler and engine, the improvement comprising said compartment including edge means defining an opening located above the engine and having an upper portion of the muffler shell located therein; an upper heat shield section spaced above said opening and being dimensioned so as to overlap said edge means in its entirety; said upper heat shield section having an opening therein; an exhaust pipe fixed to the upper heat shield section in communication with said opening; said outlet pipe projecting into said exhaust pipe and being spaced therefrom so as to leave an annular space between the exhaust and outlet pipes; a lower heat shield section in the form of a box having an open top located beneath said upper heat shield section and having the muffler shell located therein; and means supporting said upper and lower heat shield sections on said engine exclusive of said frame.

4,011,850

FUEL VAPORIZER FOR INTERNAL COMBUSTION ENGINES

Kenneth L. Knox, Sr., 1796 Hillboro Ave., Reno, Nev. 89502

Filed July 30, 1975, Ser. No. 600,320
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **1 Claim**



1. In combination with an internal combustion engine a fuel vaporizer comprising an intake manifold plate adapted to be connected to the engine, a plurality of pipes communicating with said engine through said plate and rigidly connected to said plate said pipes having substantially equal lengths and diameters, a generally cylindrical housing rigidly secured to the opposite end of said pipes and communicating therewith, an impeller blade in said housing rotated at high speed by air and fuel passing through said housing for vaporizing the fuel, means providing a mounting for a carburetor including a flat plate positioned closely adjacent said impeller blade and having a pair of relatively large bores equispaced on opposite sides of the axis of said impeller blade and communicating with the carburetor, and air deflection means including a pair of elements carried by said flat plate and extending respectively transversely of said bores with said elements sloping oppositely of each other and toward said impeller for causing the flow of air to impinge on the impeller blade in a direction to drive the impeller blade at high speed.

4,011,851

DISTRIBUTOR ASSEMBLY FOR A VEHICLE

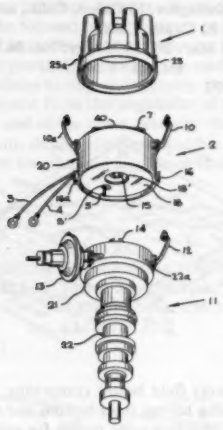
Eden E. Beutler, 4830 Zube Court, Carmichael, Calif. 95608

Filed Aug. 25, 1975, Ser. No. 607,223
Int. Cl.² F02P *7/02*
U.S. Cl. 123—146.5 A **7 Claims**

1. In a distributor assembly for a vehicle including a distributor cap having a plurality of spaced contact terminals internally thereof and a rotor shaft assembly having a vacuum advance mechanism adapted to be engaging by a vacuum advance actuating pin and an upper housing assembly operatively connected to said vacuum advance mechanism with a rotor shaft axially extending through said rotor shaft assembly adapted to be connected to the lower end of a connecting shaft, and a rotor adjusted to be removably secured to the upper end of said connecting shaft, the improvement which comprises:

a removable cartridge assembly including a housing having

an outer wall and closed at one end by a top wall and the lower end by a bottom wall and having said connecting shaft axially extending therethrough and rotatable therein, said connecting shaft extending through said top wall and having rotor connecting means at its upper end for fixedly and removably securing said rotor thereto for rotation therewith in a predetermined orientation and accessible through said bottom wall and having a rotor shaft connecting means at its lower end for fixedly and removably securing said rotor shaft thereto for rotation therewith, said cartridge assembly further including first distributor cap connecting means associated with said housing for fixedly and removably securing said cartridge assembly to said distributor cap and second connecting means associated with said housing for fixedly and removably securing said cartridge assembly to said rotor shaft assembly, said cartridge assembly further including said vacuum advance actuating pin therein extending through said bottom wall and having its lower end operatively engaging said vacuum advance mechanism when said



cartridge assembly is connected to said rotor shaft assembly, said rotor selectively engaging said contact terminals when said cartridge assembly is connected to said distributor cap, said cartridge assembly further including a cam rotatably connected to said connecting shaft internally of said housing between said top and bottom walls, and a breaker point assembly mounted internally of said housing and breaker point assembly actuating means associated with both said cam and said breaker point assembly for actuating said breaker point assembly when said cam is rotated, the upper end of said vaccum advance actuating pin being operatively connected to said breaker point assembly, and a pair of electrical connecting means, one of said electrical connecting means being operatively connected at one end to said breaker point assembly and having its free end extending out of said cartridge assembly and the other of said electrical connecting means being operatively connected at one end to said cartridge assembly and having its free end extending to a point remote from said cartridge assembly.

4,011,852

CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES

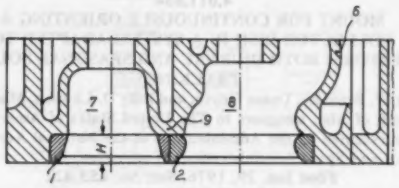
Walter Rasch, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

Filed Feb. 14, 1975, Ser. No. 550,154

Claims priority, application Germany, Feb. 16, 1974, 2407528

Int. Cl.² F22B *5/00*

U.S. Cl. 123—188 S **4 Claims**



1. A cylinder head for internal combustion engines with at least two passages arranged adjacent to each other and respectively provided for valves, which includes in combination a plurality of pressed-in seating rings corresponding in number to that of said passages into which said rings are pressed and associated therewith, each of said seating rings having parallel end faces with an outer peripheral surface extending between and connecting said end faces, that outer peripheral surface being cylindrical over the major periphery of said ring and provided with an outer flattened peripheral area, each two flattened areas of two adjacent rings facing each other and directly engaging each other, each flattened outer peripheral area extending over the entire height of the pertaining seating ring between said end faces, said seating rings over the entire height thereof being press-fitted tightly into recesses of the cylinder head without providing a partial gap as seen over periphery thereof.

4,011,853

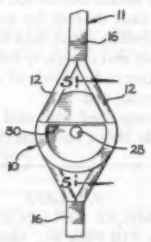
ARCHERY PEEP SIGHT

James D. Fletcher, P.O. Box 218, Bodfish, Calif. 93205

Filed July 31, 1975, Ser. No. 600,609

Int. Cl.² F41B *5/00*

U.S. Cl. 124—87 **7 Claims**



1. An archery peep sight for mounting upon an archery bowstring comprising a symmetrical member having first and second end faces in planes that are in parallel spaced relation to one another, a sight opening centrally disposed through said symmetrical member, the axis of said sight opening being perpendicular to each one of said planes of said symmetrical member, a first recessed portion being symmetrically disposed into said first end face, the apex of said first recessed portion said sight opening, a second recessed portion being disposed into said second end face and being including an end portion

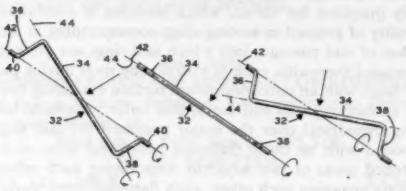
of complementary to a portion of said first recessed portions, said second recessed portion including a planar surface adjacent said sight opening and lying in a continuous plane extending in the general direction of the axis of the sight opening, the plane of said planar surface being perpendicular to the plane of said second end face, and a pair of parallel, archery bowstring receiving channels disposed on the periphery of said symmetrical member and intersecting the planes of said faces, the archery bowstring receiving channels being enagageable by separated portions of a single archery bowstring.

4,011,854

MOUNT FOR CONTINUOUSLY ORIENTING A COLLECTOR DISH IN A SYSTEM ADAPTED TO PERFORM BOTH DIURNAL AND SEASONAL SOLAR TRACKING

Lott W. Brantley, Union Grove, and Billy D. Lawson, Madison, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 29, 1976, Ser. No. 653,422
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **6 Claims**



1. In a solar tracking system including a solar energy collector dish, an improved mount for continuously orienting the dish relative to the sun comprising:

A. means for maintaining the collector dish in a reference plane through which a line projected from the sun extends substantially perpendicularly as the earth rotates on its polar axis, including a rigid axle having a linear midportion connected in supporting relation with said dish and oppositely extended end portions normally related to the midportion;

B. each of the extended end portions having an outwardly projected end which extends in opposing directions with respect to each other and coaxial to an axis of rotation;

C. spaced journal means connected to said end portions at said projected ends thereof for supporting said axle for angular displacement about said axis of rotation parallel to said polar axis and obliquely related to an axis coincident with the longitudinal axis of symmetry for the midportion of the axle; and

D. drive means connected with said axle for angularly displacing said axle about said axis of rotation.

4,011,855

SOLAR COLLECTOR

Frank R. Eshelman, 910 Fifth St., Ames, Iowa 50010

Filed May 31, 1974, Ser. No. 475,208
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **9 Claims**

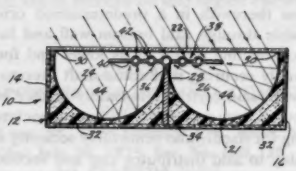
1. A solar collector comprising:

a light collecting member having an outer surface of light absorptive material adapted to retain a maximum amount of light which strikes said collecting member;

said light collecting member having at least one fluid passageway therein;

a light reflecting member having upper margins defining a light receiving opening, and having at least one concave surface extending between and below said upper margins, said concave surface comprising in cross section two curves following circular paths and intersecting at a point beneath and between said upper margins

said light collector being substantially smaller than the width of said opening;



said light reflector being positioned with respect to said light collector so that every light ray entering said opening is directed into engagement with said light collector

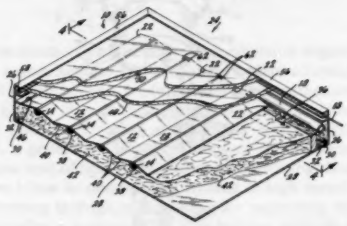
said light collecting member extending over portions of both of said curves and being below said upper margins of said opening.

4,011,856

SOLAR FLUID HEATER

Robert George Gallagher, El Cajon, Calif., assignor to Energy Systems, Inc., El Cajon, Calif.

Filed Mar. 28, 1975, Ser. No. 563,091
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **19 Claims**



1. A solar energy fluid heater comprising:

an open housing having rigid bottom and side panels;

a plurality of abutting solar panels for collecting solar energy positioned within said housing, said solar panels each having an upper surface positioned below the opening in said housing for collecting solar energy, an open circular channel formed in the center portion of said panel having an opening smaller than the diameter of said channel along the longitudinal center of the solar panel, said channel being below said opening and said upper surface and the portions of the upper surface adjacent each side of said opening having a linear downward slope;

a conduit member positioned within said channel said conduit having a diameter greater than the relaxed diameter of said channel and a length sufficiently long to extend from each end of said solar panel;

header members one connecting each adjacent end of said conduit and extending to the exterior of said housing;

a plurality of support members having a spaced apart relationship positioned along said bottom panel of said housing for spacing said solar panels from said bottom panel;

insulation means positioned between said solar panels and said bottom;

at least one panel of translucent material spaced above said upper surface of said solar panel having a sealed relationship with said side panels and forming a closure for the opening of said housing; and

pressure applying means for securing the edges of the adja-

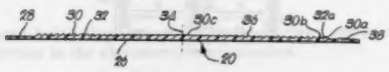
cent panels in firm physical contact to ensure heat transfer between said adjacent panels by conduction.

4,011,857

SOLAR ENERGY CONVERTER AND ELONGATED FRESNEL LENS ELEMENT

Harold D. Rice, 25th and McGee Trafficway, Kansas City, Mo. 64141

Filed Nov. 24, 1975, Ser. No. 634,763
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 **32 Claims**



1. A solar radiation concentrator comprising:

a sheet element having a series of elongated, generally straight, side-by-side, essentially parallel, radiation focusing surfaces conjointly presenting a solar radiation focusing area,

said surfaces being of transversely angular configurations relative to one another, causing solar rays impinging on said area to be focused by the surfaces onto an elongated zone spaced from the area of narrower width than the latter to concentrate the radiation in said zone,

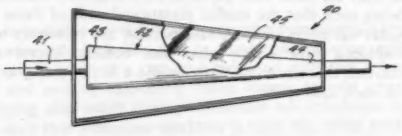
each of said surfaces having an angularity at one end thereof which is different from the angularity of such surface at the opposite end of the same, whereby the zone of focus is oriented with the longitudinal axis thereof at an angle relative to the longitudinal lengths of said surfaces.

4,011,858

SOLAR CONCENTRATOR

Earl R. Hurkett, 311 W. Platte, Fort Morgan, Colo. 80701

Filed Feb. 9, 1976, Ser. No. 656,648
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **2 Claims**



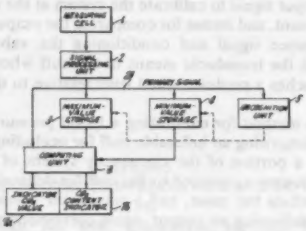
1. A solar concentrator, comprising in combination, an elongated reflector, which is a parabola cross-sectional shape, a reflective material on an inner surface of said reflector, a pipe extending along a longitudinal axis of said reflector and being located along a focal point of said reflector, and means for rotating said reflector in order to follow a path of the sun; said pipe having a portion thereof extending within said reflector, a glass tube enclosing said portion, an outwardly extending sleeve integral with each end wall of said reflector, said sleeves being axially aligned, said pipe extending through said sleeves, said sleeves being supported within bearings mounted in stanchions stationarily placed upon a supporting surface, one said sleeve having a gear secured thereto, said gear engaging a gear mounted on a shaft of an electric motor, and a portion of said pipe contained within said reflector being diametrically enlarged at one end, said pipe portion, accordingly, being conical in configuration, said diametrically enlarged end of said pipe portion being located adjacent an end of said pipe that forms an entry for cold water passing through said pipe.

4,011,859

METHOD FOR CONTINUOUSLY MEASURING THE CO_2 CONTENT IN BREATHING GASES

Horst Frankenberger, Bad Schwartau, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Sept. 2, 1975, Ser. No. 609,564
Claims priority, application Germany, Sept. 5, 1974, 2442589
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 C **3 Claims**



1. A gas measuring method on the principle of infrared absorption for continuous measuring of the CO_2 content in breathing gases while using a measuring cell along with a luminous source, an interference filter accorded to CO_2, and a photodetector, wherein the measured values of the measuring cell which is placed in the breathing-air stream are processed in a signal processing unit which is controlled by a breathing-air phase recognition unit, the respective maxima and minima of the measured values in each breathing phase are stored in a maximum-value storage and a minimum-value storage, said values, controlled by the breathing-air phase recognition unit, are divided and the logarithm is taken thereof in a computation unit and, since

$$l_n \frac{I_{expir.}}{I_{inspir.}} \triangleq c_{CO_2},$$

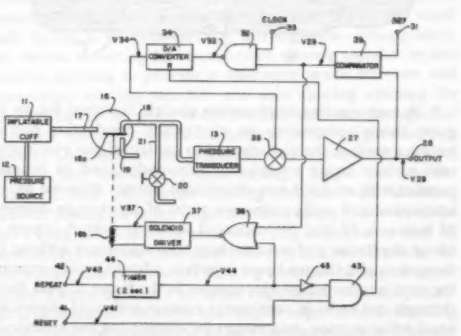
the CO_2 content at the end of the expiration phase is indicated in an indicating unit.

4,011,860

CALIBRATED BLOOD PRESSURE MEASURING SYSTEM AND METHOD

John J. Lee, Cupertino, Calif., assignor to Filac Corporation, Sunnyvale, Calif.

Filed Oct. 20, 1975, Ser. No. 623,719
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 M **8 Claims**



1. In a blood pressure measuring system of the type having

an inflatable cuff for occluding the flow of blood in a portion of the circulatory system of a patient, a pressure source connected to the cuff for delivering air to the cuff to inflate the same, and transducer means connected to the cuff for delivering an output signal corresponding to the pressure in the cuff, the improvement comprising: valve means connected between the cuff and the transducer means for controlling communication between the cuff and the transducer means, means for conditioning the valve means to disconnect the transducer means from the cuff at the outset of a blood pressure measurement, a reference signal source, means for changing the level of the output signal to calibrate the system at the outset of the measurement, and means for comparing the output signal with the reference signal and conditioning the valve means to reconnect the transducer means to the cuff when the output signal reaches a predetermined level relative to the reference signal.

7. In a method for calibrating a blood pressure measuring system comprising an inflatable cuff for occluding the flow of blood in a portion of the circulatory system of a patient, a pressure source connected to the cuff for delivering air to the cuff to inflate the same, and a transducer connected to the cuff for delivering an output signal corresponding to the air pressure in the cuff, the steps of: disconnecting the transducer from the cuff and establishing a reference pressure in the transducer at the outset of a blood pressure measurement, comparing the output signal with a reference signal, adjusting the level of the output signal in discrete increments until the output signal reaches a predetermined level relative to the reference signal, and reconnecting the transducer to the cuff when the output signal reaches the predetermined level.

4,011,861

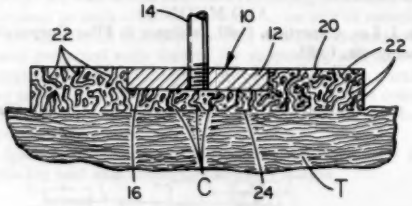
IMPLANTABLE ELECTRIC TERMINAL FOR ORGANIC TISSUE

Carl C. Enger, Lakewood, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio

Continuation-in-part of Ser. No. 457,467, April 3, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,191

Int. Cl.[2] A61B *5/04;* **A61N** *1/04*

U.S. Cl. 128—2.06 E **26 Claims**



1. A non-reacting implantable electric terminal for an organic tissue comprising: an electrically conductive portion having a surface thereof adapted to contact tissue electrolyte, said surface being completely surrounded and in intimate contact with an inert non-absorbable porous material having interconnected and continuous pores of an average diameter of between 10 and 500 microns so as to permit ingress of blood capillaries and intermeshing with said tissue without the formation of a fibrous tissue interface adjacent said surrounding part, and to permit electrolytes in the tissue to pass therethrough and to be in continuous contact with said electrically conductive portion, and means for connecting the electrically conductive portion of said electric terminal to an electrical circuit means.

4,011,862

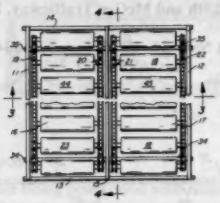
MASSAGING SUPPORT APPARATUS

Michael Kosiak, 3305 Skycroft Circle, Minneapolis, Minn. 55418

Continuation-in-part of Ser. No. 545,726, Jan. 31, 1975, abandoned. This application Nov. 17, 1975, Ser. No. 632,179

Int. Cl.[2] A61H *11/00*

U.S. Cl. 128—58 **25 Claims**



1. Apparatus for supporting a human body in a partially cradled and varied pressure manner to facilitate the movement of blood through those tissues of the body as pressed by the weight of the body against the apparatus, said apparatus comprising:

i. a frame;

ii. a pair of endless flexible belt assemblies, each said belt assembly comprising a plurality of transverse roller members arranged in substantially parallel relationship;

iii. means for mounting each said belt assembly on said frame so that each forms a body support span consisting essentially of an upper stretch of said roller members thereof, said body support span of one said belt assembly being laterally juxtaposed to said body support span of the other said belt assembly;

iv. means for moving each said belt assembly to cause said roller members thereof to move in sequence along the length of said body support span formed thereby, whereby those tissues of a body as pressed by its weight against a said span are subjected to a stroking action of alternate pressure and release of pressure as effected by said movement of said roller members; and

v. track means for supporting at least a portion of said roller members of one said span in an angular relationship to at least a portion of the roller members of the other said span at least during times when the weight of a body rests in part on each said portion, said angular relationship being such that the medial juxtaposed ends of those said roller members of each said portion are relatively more displaced downwardly than the outside lateral ends thereof, thereby to partially cradle a body resting in part on each said span.

4,011,863

SUPRACONDYLAR PROSTHETIC NAIL

Robert E. Zickel, 235 E. 42nd St., New York, N.Y. 10017

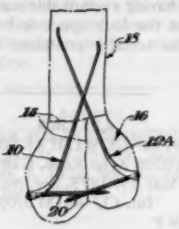
Filed July 19, 1976, Ser. No. 706,470

Int. Cl.[2] A61F *5/04;* **A61B** *17/18*

U.S. Cl. 128—92 BA **10 Claims**

1. A supracondylar prosthetic nail comprising a substantially flat elongated length of biocompatible metal having plan and elevational configurations, the plan configuration tapering from a relatively larger head to a rounded blunt tip about half the thickness of the head, the elevational configuration having a relatively thin tapered elongated midportion and arcuate head and tip ends extending on the same side of the midportion, the arcuate head end having ample inner and outer radii providing a thickness at the extremity similar to that of the plan head configuration, the arcuate tip end of the elevational configuration having relatively smaller radii

smoothly continuing the smaller end of the midportion a short distance, and a hole for a retaining screw through the end of



the head being disposed substantially at right angles to the midportion in the elevational configuration.

4,011,864

RESPIRATORY APPARATUS

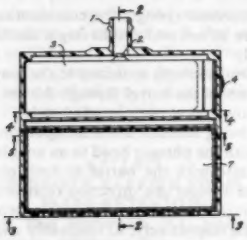
Paul Guichard, 10 Rue Gaston Darley, a Nemours 77140, France

Continuation-in-part of Ser. No. 392,341, Aug. 28, 1973, Pat. No. 3,902,486. This application Oct. 23, 1974, Ser. No. 517,429

Claims priority, application France, Aug. 29, 1972, 72.30599; Oct. 19, 1972, 72.37010; July 16, 1973, 73.25957; Oct. 24, 1973, 73.37979; Dec. 28, 1973, 73.47116

Int. Cl.² A61M *16/00*

U.S. Cl. 128—140 N **9 Claims**



1. In portable nasal diffuser apparatus comprising a respiratory assembly including means for communicating with the respiratory tract of a user and provided with two apertures, first and second respective valve means at said apertures operating alternately during exhalation and inhalation by the user such that when one aperture is open the other is closed, one of said apertures communicating via the respective valve means with the atmosphere, a reservoir having an inlet and containing means for treating air admitted into the reservoir, means connecting the reservoir to the respiratory assembly at the other of the apertures thereof, such that upon inhalation said valve means associated with the said other aperture is opened and air is admitted to the reservoir and flows through the treating means therein to the respiratory assembly and to the user, and means for effecting heating of the air supplied to the reservoir including means for enabling the reservoir to be positioned proximate the body of the user to capture heat therefrom, said treating means comprising a filter substance and a housing containing said filter substance and having openings for passage of air through said filter substance, said means for communicating with the respiratory tract of the user comprising a flexible nasal mask, said body including a first portion with said one aperture therein, and a second portion connected to said connecting means, said first and second valve means being supported in said body, each said valve means comprising a flat member pivotably connected in said body adjacent its respective aperture, said flat members being disposed horizontally, said one aperture being disposed in said one portion of said body below its respective flat member, said connecting means extending below the other flat member, and abutment means extending internally in said body proximate said apertures to support the respective valve members in a position of rest such that each valve member is movable in one direction only to be opened, an improvement wherein said treating means comprises an atomizer containing a volatile aromatic product, and push-button means for activating said atomizer to directly introduce vaporized aromatic product into said respiratory assembly along with respirated air.

4,011,865

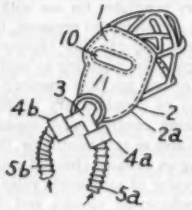
DUST-PROOF PROTECTION MASK OF FACE COVERING TYPE

Mitsu Morishita, No. 698, Takemukai, Myohoji, Sumaku, Kobe, Japan

Filed Sept. 26, 1975, Ser. No. 617,121

Int. Cl.² A62B *7/12*

U.S. Cl. 128—142.3 **1 Claim**



1. A dust-proof protective mask comprising a mask body adapted to fit onto a wearer's face, said mask body having an air inlet opening, a first air inlet pipe connected to said air inlet opening, an electrically driven air blower on said first air inlet pipe for feeding air under pressure to said air inlet opening, an air filter on said first air inlet pipe, a second air inlet pipe connected to said first air inlet pipe, a manually-operated air blower means mounted on said second inlet pipe and operably mounted in parallel with said electrically driven air blower, said first and second air inlet pipes each having lower ends, a three-way valve to which said lower ends of said first and second air inlet pipes are connected for selectively switching flow of atmospheric air to said first or second air inlet pipes, said mask body having a peripheral edge, clearance means on said peripheral edge for leaking out air from between said clearance means and the user's face, said mask body having a viewing opening, a transparent viewing member, means mounting said transparent viewing member in said viewing opening to provide a clearance space between said transparent viewing member and said viewing opening for allowing air on the inside of the mask to blow out through said clearance space, a colored transparent welding light shielding member mounted on the inside of said transparent viewing member, said shielding member having a height less than the height of said transparent viewing member, said shielding member having an upper edge disposed above the level of the user's eyes, said shielding member being effective to shut off harmful rays of ultra-violet, infrared rays and the like from the user's eyes, said transparent viewing member having an upper portion extending above an upper edge of said shielding member and disposed between said upper edge of said shielding member and the upper edge of said viewing opening, whereby the wearer of the mask may freely see the outside through said upper portion of said transparent viewing member.

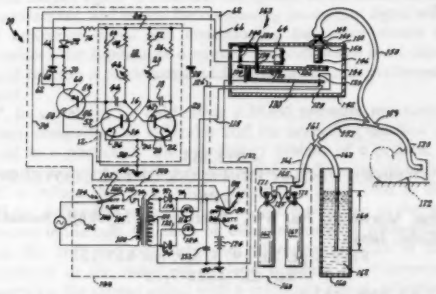
4,011,866
ELECTRONICALLY CONTROLLED PULMONARY VENTILATOR

Fritz F. Klein, Hudson, N.H., and Oliver C. Morse, III, Berkeley, Calif., assignors to Automatic Breathing Apparatus Co., Inc., Boston, Mass.

Continuation of Ser. No. 430,602, Feb. 5, 1965, abandoned. This application Aug. 26, 1968, Ser. No. 767,016

Int. Cl.² A62B 7/02

U.S. Cl. 128—145.8 **8 Claims**



1. In a pulmonary ventilator for use with a reservoir of gas having an outlet at a preselected pressure, the combination of three intercommunicating gas flow channels, one of said gas flow channels adapted for coupling to said outlet of said gas reservoir, another of said gas flow channels adapted for insertion in the trachea of a pulmonary ventilation recipient, a single relay breathing control valve means having a single breathing control valve in said ventilator, the third of said gas flow channels being an exhaust channel coupled to said single breathing control valve of said single relay breathing control valve means for selectively closing and opening said third channel to passage of said gas and thereby respectively applying said preselected pressure gas to said trachea and exhausting said gas through said third channel, and electronic timer control means coupled to the relay of said relay breathing control valve means to cause alternate closing and opening of said single breathing control valve in accordance with a preselected time schedule.

4,011,867
DIVER'S PRESSURE CHAMBER SYSTEM

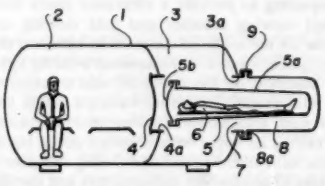
Arne-Johann Arntzen, Fyllingsdalen, Norway, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Sept. 30, 1975, Ser. No. 618,131

Claims priority, application Germany, Oct. 4, 1974, 2447362

Int. Cl.² B63C 11/32; A61M 16/02

U.S. Cl. 128—204 **8 Claims**



1. A diver's pressure chamber system for use with a fixed pressure chamber having a sealable access and using a transportable sealed diver's transfer container for the diver, comprising, a tubular projection formed around the access, a separate portable cylindrical lock space part hermetically engageable and sealable with said tubular projection and defining with said tubular projection and said access a pressurizable lock space which may be brought to a desired transfer pressure, and a sealed diver's transfer container positionable in said lock space having a removable sealing cover which may be removed when the lock space is brought to a pressure comparable to the transfer container and to the pressure chamber.

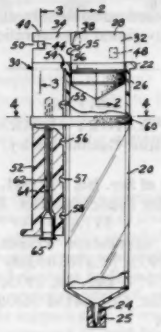
4,011,868
HYPODERMIC SYRINGE WITH ARTICULATE PLUNGER

John H. Friend, 10200 Arno Road, Galt, Calif. 95632

Filed May 19, 1975, Ser. No. 578,676

Int. Cl.² A61M 5/00

U.S. Cl. 128—218 P **15 Claims**



1. In a hypodermic syringe, the combination of:
a barrel open at one end and having a discharge port at the other end;
a plunger head slidingly mounted in the barrel to discharge the contents of the barrel through the discharge port; and
a shank connected to the plunger head;
said shank being foldable from an operating configuration aligned with the plunger head to an angular configuration to cooperate with the barrel to limit movement of the plunger in at least one direction relative to the barrel;
said combination including cooperative means on the shank and barrel, respectively, to releasably engage each other at the angular configuration of the shank to immobilize the plunger head in the barrel.

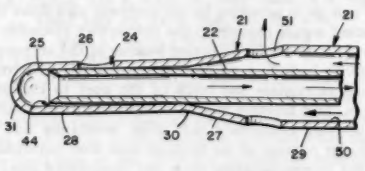
4,011,869
TUBULAR CUTTING INSTRUMENT

William Seiler, Jr., Van Nuys, Calif., assignor to David Kopf Instruments, Tujunga, Calif.

Filed Aug. 1, 1975, Ser. No. 600,897

Int. Cl.² A61M 1/00; A61F 9/00; A61B 17/32

U.S. Cl. 128—276 **7 Claims**



1. In a cutting instrument having an elongated tubular housing formed with a cutting orifice, a resilient, inner tubular member slidably mounted coaxially within said tubular housing, and driving means for reciprocating said inner tubular member, the improvement comprising:

means defining a bend in said tubular housing between said driving means and said cutting orifice displacing said cutting orifice in a direction toward said resilient, inner tubular member, such that as the end of said resilient, inner tubular member passes across said cutting orifice, said end is resiliently urged into shearing contact with said cutting orifice.

4,011,870

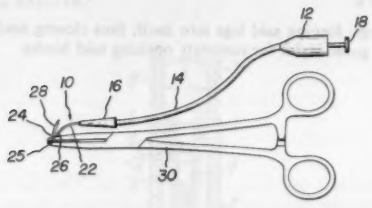
NEEDLE INSTRUMENT

Michael Goldstein, 192 15C 67th Ave., New York, N.Y. 11635

Filed Mar. 5, 1976, Ser. No. 664,327

Int. Cl.² A61B *17/32*

U.S. Cl. 128—276 **6 Claims**



1. A needle instrument for performing peripheral iridectomy for narrow angle glaucoma comprising a hollow needle having a bore extending therethrough and having a first bend and a second bend, said first bend being substantially a right angle bend and contained substantially within a single plane, said second bend being substantially a U-shaped bend and being disposed in a plane subtantially perpendicular to said first plane, a source of suction and means connecting said needle to said source of suction such that suction may be drawn through said bore of said needle, said needle instrument being adapted to be grasped by a hemostat or the like along said U-shaped bend to facilitate manual manipulation during performance of the peripheral iridectomy.

4,011,871

WATER-DISPERSIBLE BARRIER FILMS FOR BODY FLUID RETENTION

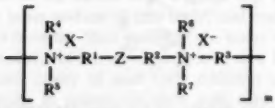
Arnold Jay Taft, East Brunswick, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Mar. 17, 1975, Ser. No. 559,205

Int. Cl.² C07C *87/30*

U.S. Cl. 128—284 **11 Claims**

1. In a product for absorbing body fluids including a barrier film for retaining said body fluids, the improvement which comprises employing as said barrier film a polymeric film of a cationic polyurethane having a repeating unit of the formula:



wherein R^1 and R^2 are selected from the group consisting of $-CH_2-$ and alkylene containing 2 to 4 carbon atoms, inclusive; Z is a linking condensation residue of a polyisocyanate with a polyol and contains at least four urethane linkages; R^3 is alkylene containing 2 to 4 carbon atoms, inclusive; R^4, R^5, R^6, and R^7 are lower alkyl containing 1 to 4 carbon atoms, inclusive; X is a halogen selected from the group consisting of chlorine and bromine, and *m* is an integer of sufficient magnitude to form a film; the equivalent weight of the polymer, expressed as the ratio of the molecular weight of the repeating unit divided by the number of R^+ in the repeating unit, being from about 500 to about 2000, whereby said film is resistant to body fluids but dispersible in water.

4,011,872

ELECTRICAL APPARATUS FOR TREATING AFFECTED PART IN A COELOMA

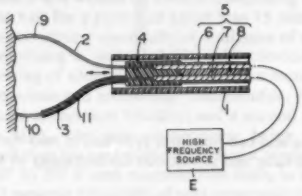
Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1975, Ser. No. 563,071

Claims priority, application Japan, Apr. 1, 1974, 49-37269; Apr. 1, 1974, 49-37270

Int. Cl.² A61B *17/36*

U.S. Cl. 128—303.14 **10 Claims**



1. An electrical apparatus for treating an affected part in a coeloma comprising:

an electrically insulating, hollow, flexible tube having a distal end and a proximal end and adapted to be inserted into a coeloma and having an opening in its distal end;

an electrode operating member formed of an insulating material and having a first end facing said distal end of said flexible tube and a second end facing said proximal end of said flexible tube, said electrode operating member being slidably disposed within said flexible tube such that said electrode operating member can slide towards and away from said distal end of said flexible tube;

a plurality of treating electrodes each being formed of a resilient, conductive material, each of said treating electrodes having a free end and a base end, said base ends of said treating electrodes being attached to said first end of said electrode operating member, said free ends of said treating electrodes extending towards said opening in said flexible tube for movement out of and into said opening in said flexible tube in response to movement of said electrode operating member;

an operating wire extending from said proximal end of said flexible tube into said flexible tube and secured to said second end of said electrode operating member for causing displacement of said electrode operating member in response to displacement of said operating wire into and out of said flexible tube, said operating wire including power cable means for supplying a high frequency current to the treating electrodes.

4,011,873

SURGICAL INSTRUMENT FOR LIGATURES

Axel Hoffmeister, Kantstr. 13, 68 Mannheim, 1, Germany

Filed July 11, 1975, Ser. No. 595,011

Claims priority, application Germany, July 13, 1974, 7423891[U]

Int. Cl.² A61B *17/12, 17/06*

U.S. Cl. 128—326 **3 Claims**

1. A surgical instrument for ligatures, comprising:

a handle provided with an opening therein, a rod, means removable mounting said rod in said handle, two spools, and means mounting said spools on said rod for independent rotation with respect to each other, and

a tube having a first open end attached to said handle so as to provide communication between said handle and said tube and a second closed end, a curved portion interme-

diate said ends of said tube, the outer surface of said tube at the inner portion of said curve having a cylindrical

surface and two openings provided in said curved portion of said tube and positioned diametrically to each other.

4,011,874

DORNO RAY TRANSMITTING SHEET

Masahiro Segawa, Iwaki; Mitsuo Onozuka, Yokohama; Ichiroh Ishibashi, Iwaki; Shinsuke Yoshikawa, Iwaki, and Shigeru Saitoh, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 17, 1974, Ser. No. 480,447

Claims priority, application Japan, June 16, 1973, 48-67894

Int. Cl.² A61N *5/06;* **G02B** *1/04;* **C08F** *3/22*

U.S. Cl. 128—362 **5 Claims**

1. A melt-molded polyvinylidene fluoride or polymonochlorotrifluoroethylene sheet having a thickness of about 20 μ to 2 mm and a spherulite size of between about 0.1 to 10 μ, whereby the sheet transmits between about 40% and about 80% of the dorno rays in a wavelength region of about 2,800 to 3,300A; said sheet having been formed by stretching in at least one axial direction a sheet formed from polyvinylidene fluoride or polymonochlorotrifluoroethylene resin having an inherent viscosity ranging from about 0.8 to 1.8.

4. A sun-room containing at least one light-admitting plate for admitting physiologically active rays in sunlight, said light-admitting plate comprising a plate of melt-molded polyvinylidene fluoride or polymonochlorotrifluoroethylene plate having a thickness of about 20 μ to 2 mm and a spherulite size of between about 0.1 to 10 μ, whereby the plate transmits between about 40% and about 80% of the dorno rays in a wavelength region of about 2,800 to 3,300 A; said plate having been formed by stretching in at least one axial direction a plate formed from polyvinylidene fluoride or polymonochlorotrifluoroethylene resin having an inherent viscosity ranging from about 0.8 to 1.8.

4,011,875

MEDICAL ELECTRODES

Siegfried R. Lehr, Mottlst. 17, D8 Munich 40, and Alfred Schaudig, Athosstr. 9a, 8 Munich, both of Germany

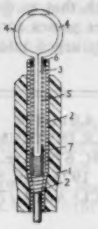
Filed Feb. 25, 1974, Ser. No. 447,241

Claims priority, application Germany, Feb. 27, 1973, 2309749

Int. Cl.² A61N *1/04*

U.S. Cl. 128—418 **3 Claims**

1. A medical electrode for implantation in a body, comprising a hollow conductor, 2 forcep-like hooks at the tip of the electrode, having legs connected together, said hooks opening by resilience of said legs, a compression coil spring around



said legs, forcing said legs into itself, thus closing said hooks and a guide stylet for remotely opening said hooks.

4,011,876

DEVICE FOR WITHDRAWING TOBACCO FROM THE MAGAZINE OF A TOBACCO DISTRIBUTOR

Günter Wahle, Reinbek, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed May 15, 1975, Ser. No. 577,750

Claims priority, application United Kingdom, June 4, 1974, 24593/74

Int. Cl.² A24C *1/02, 5/39*

U.S. Cl. 131—109 R **10 Claims**

1. In a tobacco distributor for cigarette making machines, a combination comprising a magazine arranged to store a supply of tobacco particles, particularly a supply consisting mainly of relatively long and relatively short tobacco shreds; and a device for withdrawing tobacco from the supply in said magazine, including an entraining member having an annulus of teeth and projections extending outwardly from said teeth, and means for moving said teeth along an endless path a portion of which is immediately adjacent to the supply of tobacco in said magazine so that the teeth and projections in said portion of said path remove, support and advance a substantially continuous layer of tobacco particles from said supply.

4,011,877

MOUTHPIECE FOR SMOKING TOBACCO

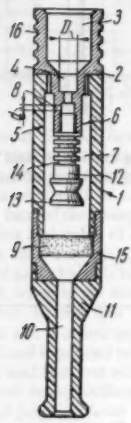
Ivan Mikhailovich Fedorchenko, ulitsa Vladimirskaya, 51/53, kv. 32; Vasily Sergeevich Pugin, ulitsa Dobrokhotova, 2, kv. 32; Vladimir Itskhok-Nukhimovich Abiov, ulitsa Pozharskogo, 2, kv. 23; July Yakovlevich Fridman, Novo-Gostomelskoe shosse, 17, kv. 65, and Mikhail Shaevich Goldberg, ulitsa Patrisa Lumumby, 20, kv. 59, all of Kiev, U.S.S.R.

Continuation of Ser. No. 507,530, Sept. 19, 1974, abandoned, which is a continuation of Ser. No. 344,029, March 22, 1973, abandoned. This application Feb. 26, 1976, Ser. No. 661,805

Claims priority, application U.S.S.R., June 12, 1972, 1790302

Int. Cl.² A24F *13/04*, *1/08*

U.S. Cl. 131—187 4 Claims



1. A mouthpiece for smoking tobacco and tobacco articles, comprising: a body member having a cavity; a filter member made of sintered metal material and located axially in said cavity of said body; a holder arranged co-axially with said body, said holder having a cavity designed to contain tobacco or tobacco articles; an inlet channel for the passage of smoke in said holder in communication with said cavity of said holder; a portion including one end of said holder located in said cavity of said body and removably fastened therein; said holder portion of said body having a radial orifice formed therein communicating with said inlet channel and having a diameter which is considerably smaller than the diameter of said inlet channel, said orifice defining a first reduced area passageway for said smoke to ensure the conversion of the resin vapours in the smoke into a liquid and to settle them down on the inner surface of said body, said end of the holder being spaced from the filter member; the inner surface of said body and a section of the outer surface of said holder portion located in said cavity of said body defining a substantially annular passage in communication with said inlet channel through said radial orifice, said substantially annular passage defining a free space for receiving said smoke from said orifice and in which said smoke expands and cools, said portion of said holder in said body comprising an elongated stem having a plurality of peripheral grooves in its outer surface and terminating in an enlarged free end spaced upstream from said filter means, said enlarged free end and the inner surface of said body defining therebetween a second reduced area passageway for said smoke to further cause the liquid in said smoke to settle on to said enlarged free end, the smoke in said body cavity expanding after passing said second reduced area passageway and then passing through said filter means.

4,011,878

PROCESS FOR PERMANENTLY WAVING HAIR USING A SELF-HEATING NEUTRALIZING COMPOSITION CONTAINING A WATER-SOLUBLE SULFITE, METABISULFITE OR BISULFITE AND H_2O_2

Jean-Louis Abegg. and Claire Gayet, both of Paris, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 346,025, March 29, 1973, Pat. No. 3,865,930. This application Nov. 29, 1974, Ser. No. 528,481

Claims priority, application Luxembourg, Apr. 4, 1972, 65099

Int. Cl.² A45D *7/06*; A61K *7/09*, *7/11*

U.S. Cl. 132—7 4 Claims

1. A process for effecting the second stage of a permanent wave operation of the hair, said hair previously having been reduced, rinsed and wound on rollers, comprising the steps of treating said hair for a period of about 5 to 15 minutes with a composition consisting essentially of a mixture of a first component comprising a water-soluble salt selected from the group consisting of sodium, potassium and ammonium sulfite; sodium, potassium and ammonium metabisulfite; and sodium, potassium and ammonium bisulfite; and a second component comprising H_2O_2, the said components being present in amounts such that the said mixture exhibits a temperature rise of about 15° to 25° C and contains free H_2O_2 in amounts of about 0.5–3 percent by weight of said composition, removing said rollers and rinsing said hair.

4,011,879

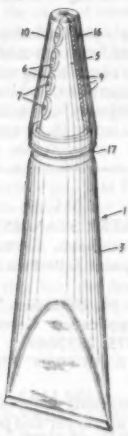
COMBINATION APPLICATOR-DISPENSER HAIR STYLER

Shepard D. Roberts, P.O. Box 136-Brevoort Station, Brooklyn, N.Y. 11216

Filed June 3, 1976, Ser. No. 692,319

Int. Cl.² A45D *2/12*

U.S. Cl. 132—9 8 Claims



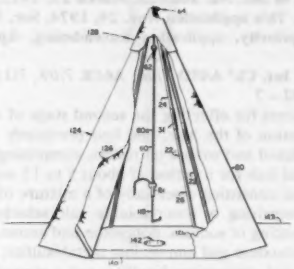
1. A hair treatment applicator-dispenser comprising, a container for containing; therein a preparation usable for application to hair; a hair curler closing said container; said hair curler comprising a removable tubular cover on said container closed at one end and closing said container in use as a cover and usable as a hair curler having a length sufficient for wrapping hair therearound; said curler including a tubular hood removably mounted on said container axially over said cover; and said hood having one end closed and another open when removed from said container and a cross section dimensioned for fitting axially over said cover in use as a hair curler with hair wrapped therearound.

4,011,880

TENT STRUCTURE

Glen E. Shoults, 421 W. Elm St., Hartford City, Ind. 47348

Filed Sept. 11, 1975, Ser. No. 612,327
Int. Cl.² A45F *1/16*
U.S. Cl. 135—1 C **3 Claims**



1. Tent structure comprising:

a plurality of elongate tent staves pivotably connected at one of their respective ends to a common member and supportable at their distal ends to a tent supporting surface;

a tent cover;

means for connecting said cover in supported relation to said staves to define a tent enclosure when said staves are pivoted divergingly from one another;

an elongate tensile strand;

means for connecting one end of said strand to said common member; and said strand adapted to be coupled at its distal end to the supporting surface, said staves being placed in compression upon application of a tensile stress to said strand;

said common member comprises an elongate pin;

each of said staves having a bracket at said one of their respective ends;

each bracket having a pin receiving opening therein;

said pin being inserted through said openings; and

means for resiliently compressing said brackets towards one another longitudinally of the pin so that when said staves are pivoted convergingly, said brackets can move longitudinally of and pivotably about said pin.

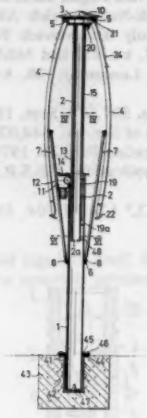
4,011,881

LARGE SHELTER STANDING UMBRELLA

Klaus Becher, Gummersbach, Germany, assignor to Carl Becher oHG Planen-und Zelte-Fabrik, Gummersbach, Germany

Filed Aug. 26, 1975, Ser. No. 607,798
Claims priority, application Germany, Aug. 31, 1974, 2441817; July 24, 1975, 2533049
Int. Cl.² A45B *19/04, 25/14, 25/18*
U.S. Cl. 135—20 M **13 Claims**

1. A large shelter standing umbrella comprising a tubular support having upper and lower end portions, a slide member having upper and lower end portions, means mounting said slide member for internal telescopic reciprocal movement relative to said tubular support, a plurality of spokes pivoted at one end to the upper end portion of said slide member, a plurality of struts each pivoted at one end to an associated one of said spokes and at another end being pivotally connected to said tubular support, means carried by said support upper end portion for elevating and lowering said slide member relative to said support, said elevating and lowering means including a gear, said gear being in mesh with a longitudinally extending radially outwardly projecting toothed rack carried by said slide member, guide means internally of said tubular support for axially guiding the reciprocal movement of said slide member and limiting rotational motion thereof relative to said tubular support, and said guide means include a radially inwardly opening groove carried by said tubular support corresponding in cross section to that of said toothed rack.



4,011,882

METHOD FOR TRANSPORTING SWEET AND SOUR HYDROCARBON FLUIDS IN A PIPELINE

Robert V. Nivens, Billings, Mont.; Billy J. Williams, Ponca City, Okla.; Irvin Toole, Jr., Humble, and Elliott C. Fenton, Houston, both of Tex., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 407,030, Oct. 16, 1973, abandoned. This application Mar. 4, 1976, Ser. No. 663,947
Int. Cl.² B08B *9/00*
U.S. Cl. 137—15 **14 Claims**

1. A method for minimizing sulfur contamination of sweet hydrocarbon fluids transported in a pipeline for the transportation of sweet and sour hydrocarbon fluids said method consisting essentially of:

a. transporting a sour hydrocarbon fluid containing from 0 to about 2000 ppm of a corrosion inhibiting additive through said pipeline and thereafter;

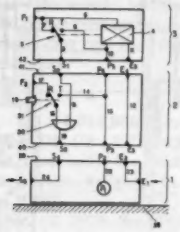
b. transporting a sweet hydrocarbon wash solution containing from about 10 to about 2000 ppm of a mixture of amines consisting essentially of light amines having a molecular weight from about 31 to 150 and heavy amines having a molecular weight from 151 to about 500 wherein the molar ratio of said light amine to said heavy amine varies from about 10:1 to about 1:10; from 0 to about 2000 ppm of a corrosion inhibiting additive; from 0 to about 500 ppm of a surfactant and from 0 to about 1500 ppm of an alkanol containing from 1 to about 6 carbon atoms in an amount sufficient to provide a wash solution contact time with the interior pipeline surfaces of at least about 1 minute and, thereafter;

c. transporting said sweet hydrocarbon fluids containing from 0 to about 200 ppm of a corrosion inhibiting additive, said mixture of amines or mixtures of said additive and said mixture of amines through said pipeline.

4,011,883
MANUAL CONTROL DEVICE FOR PNEUMATIC SYSTEMS

Eric Petrimaux, Evreux; Felix Lameyre, Rueil-Malmaison, and Daniel Bouteille, Marnes-la-Coquette, all of France, assignors to La Telemechanique Electrique, France

Filed Oct. 9, 1975, Ser. No. 620,080
Claims priority, application France, Oct. 9, 1974, 74.34051
Int. Cl.² F16K *11/20*
U.S. Cl. 137—110 **2 Claims**



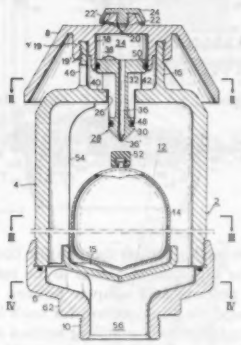
1. An auxiliary manual control device for a pneumatic system, said pneumatic system comprising: a plurality of baseplates each provided with a junction face and input, output and pressure supply channels, each of said channels having an orifice on the junction face of the baseplates, said pneumatic system further comprising a plurality of active pneumatic cells each having a junction face and input, output and pressure supply channels, each of said channels having an orifice on the junction face of the cell, wherein the auxiliary manual control device comprises a body having first and second opposite junction faces and input and pressure supply channels directly connecting first and second input and pressure supply orifices respectively located on said first and second junction faces of the body; first and second output orifices respectively located on said first and second junction faces of the body, the first junction face of a baseplate and the first junction face of the body being adapted to cooperate whereby their respective input, output and pressure supply orifices are interconnected; the second junction face of the casing and the junction face of an active cell being adapted to cooperate whereby their respective input, output and pressure supply orifices are interconnected, the casing further having an exhaust channel and a further channel which is connected to the pressure supply channel within the casing; an OR gate provided within said body and having an output connected to the said first output orifice of the body, said OR gate further having a first input connected to the second output orifice of the body, and a second input; a manually operated monostable pneumatic reverser switch provided within said body and having a first position in which it connects the second input of the OR gate to the exhaust channel and a second position in which it connects the second input of the OR gate to the said further channel.

4,011,884
LIQUID-LEVEL VALVING DEVICE PARTICULARLY USEFUL AS AUTOMATIC RELIEF VALVE

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Feb. 4, 1975, Ser. No. 546,913
Claims priority, application Israel, Feb. 12, 1974, 44200
Int. Cl.² F16K *31/34*
U.S. Cl. 137—202 **5 Claims**

1. A liquid-level responsive valving device comprising: a housing defining a first chamber and including an end wall having a central opening therethrough; an annular support circumscribing said opening externally of said first chamber; a cap including an inner annular wall and an outer annular wall coaxial therewith, said outer annular wall being internally threaded and threadedly received on said annular support with the inner annular wall constituting an open cylinder facing and in alignment with said opening in the housing end wall; a control member axially movable in said opening and having a first end disposed within said first chamber and an opposite end carrying a piston movable within said cylinder and defining a second chamber therewith; said second chamber having a small vent opening in a wall thereof; said control member being formed with a bore extending axially therethrough and establishing communication between the two chambers; the cross-sectional area of said first end of the control member in the first chamber being less than that of said opposite end thereof in the second chamber, and the mouth of the bore at said one end of the control member in the first chamber being of larger diameter than that of the vent opening in the second chamber, such that upon an increase in pressure in the first chamber, the pressure in the second chamber is likewise increased which pressure, by virtue of the larger surface area in the second chamber, causes the control member to be moved further into the first chamber; a float in the



first chamber coaxial with and axially spaced from the control member; a pilot valve element fixed to the end of the float facing said first end of the control member; said float being movable towards and away from said first end of the control member according to the quantity of liquid in the first chamber to bring the pilot valve element into engagement therewith to close the mouth of said bore whereupon the pressure in the first chamber moves the control member away from the float and further into said second chamber, or in disengagement therefrom to open the mouth of the bore whereupon the pressure in the second chamber moves the control member towards the float and further into said first chamber, guiding means in the first chamber guiding the movement of the float towards and away from the control member; and a main valve communicating with the first chamber and operated by the control member such as to be opened upon the movement of the control member further into the first chamber and to be closed upon the movement of the control member further into the second chamber.

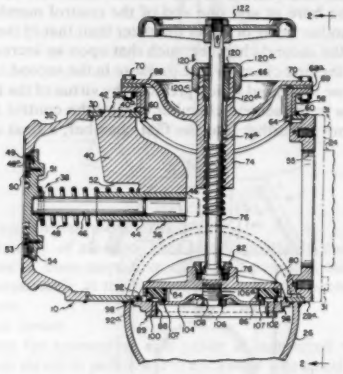
4,011,885
MANIFOLD-VALVE STRUCTURE

Joseph H. DeFrees, 414 Liberty St., Warren, Pa. 16365

Filed Sept. 11, 1975, Ser. No. 612,484
Int. Cl.² F16K *11/10*
U.S. Cl. 137—267 **12 Claims**

1. In a liquid control means for controlling liquid flow to and from a multi-compartmented liquid storage tank, said means comprising a manifold extending lengthwise and a plurality of spaced adapter portions, each of which extends in a direction generally transverse of the direction of extension of said manifold, and being nested at one side thereof in said manifold, each said adapter portion having an aperture in the opposite side thereof with a collar projecting from said aperture, said collar supporting thereon an actuatable valve in-

cluding a stem and a valve head which extends inwardly into said adapter portion in a direction toward said manifold, a valve seat formed adjacent said one side of said adapter portion and defining an opening communicating the interior of said adapter portion with the interior of said manifold, and said valve head being adapted to engage said seat to seal the manifold from said adapter portion interior, said valve head upon predetermined actuation of said valve being adapted for movement away from said valve seat to communicate the interior of the respective of said adapter portions with the interior of said manifold, each said adapter portion including



a coupling section having means thereon for coupling it to a source of liquid for supplying the latter to the associated tank via said adapter portion, said adapter portion including an inlet opening in said coupling section for such liquid and an exit opening spaced from said coupling section and in generally aligned relation to said inlet opening, said exit opening being adapted for communication with the tank and said valve being adapted to control the flow of liquid from the associated tank via the respective of said adapter portions to said manifold, said valve head when in closed condition being in generally non-interfering condition to the flow path of liquid from said inlet opening to said exit opening.

4,011,886

SLEEVE VALVE

Charles D. Wood, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Continuation of Ser. No. 365,629, May 31, 1973, abandoned. This application May 14, 1975, Ser. No. 577,468

Int. Cl.² F16K *31/124*

U.S. Cl. 137—492.5 **21 Claims**

1. A quick opening and closing sleeve valve for controlling the discharge of fluid under pressure generated by a series of repetitive explosions at a relatively rapid rate comprising:

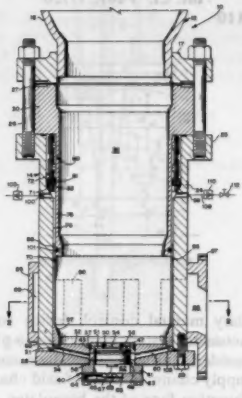
an upright housing member defining an interior pressure chamber adapted to receive said fluid pressure at said relatively rapid rate;

at least one outlet port in said housing member in fluid communication with said interior pressure chamber;

a sleeve vertically disposed in said interior pressure chamber and freely slidable relative to said housing member in response to a fluid pressure, said sleeve movable at least in part because of gravity between a first position blocking off the fluid communication between said outlet port and said interior pressure chamber and a second position permitting such communication, said sleeve having a valve actuation surface sealed from communication with said interior pressure chamber in said first sleeve position;

valve seat means associated with said housing and adapted to engage said sleeve in sealing engagement in said first sleeve position;

means associated with the end of said sleeve opposite the sealing surface thereof during only the latter part of the travel of said sleeve from said first position to said second position, and during only the first part of the travel of the sleeve from said second position to said first position, for aiding in the automatic closing of said sleeve in said first position at the end of each cycle of operation of said sleeve valve; and



pilot valve means controlling communication between said source of fluid pressure and an actuation surface associated with said sleeve, said pilot means including means responsive to a predetermined rise in pressure to shift said pilot valve to communicate said pressure to said valve actuation surface thereby actuating said sleeve to said second position.

4,011,887

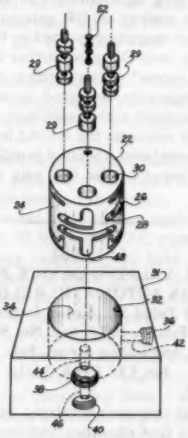
FLUID POWER CONTROL APPARATUS

Robert E. Raymond, Zanesville, Ohio, assignor to R. E. Raymond Co. Inc., Zanesville, Ohio

Filed Feb. 23, 1976, Ser. No. 660,332

Int. Cl.² F15B *13/02*

U.S. Cl. 137—608 **12 Claims**



1. In a fluid power control apparatus, the combination of a control housing means comprising a core member having a closed continuously curved outer wall surface and a receptacle means provided with an opening, said core member being

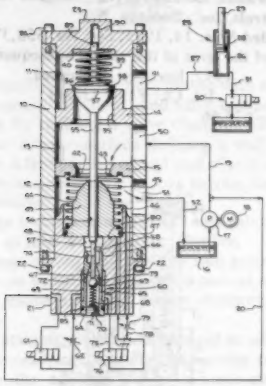
mounted in said opening in a sealed and fixed relationship between the outer wall surface of said core and the adjacently disposed inner wall surfaces defining said opening; a plurality of recesses formed in at least one of said adjacently disposed wall surfaces defining fluid paths between said wall means for communication of fluid in axial and circumferential directions; a plurality of passages in said housing means in communication with certain of said recesses for the communication of fluid to or away from said fluid paths formed between said wall means; valve means disposed in communication with said passages in said housing means to define a predetermined fluid circuit between said valve means, said passages and said fluid paths; and inlet and outlet port means in said housing means adapted for communicating said fluid circuit to external fluid power operative elements.

4,011,888

UNITARY ELEVATOR UP LEVEL CONTROL VALVE

Robert J. Wheichel, Dunwoody, Ga., and William A. P. Lawrence, Simi Valley, Calif., assignors to Elevator Equipment Co., Los Angeles, Calif.

Filed Mar. 12, 1976, Ser. No. 666,235
Int. Cl.² F15B *13/043*
U.S. Cl. 137—612.1 **9 Claims**



1. A unitary up level control valve device for a hydraulic elevator ram operating from a source of hydraulic fluid pressure comprising:

a housing having a first partition forming an up travel supply chamber adjacent one end;

a second partition forming a bypass chamber adjacent the other end and an inflow chamber intermediate said partitions and in communication with said source of fluid pressure;

a check valve passage through said first partition having a check valve seat and a check valve element normally biased to seated position thereon;

a bypass passage through said second partition having a bypass valve seat and a bypass valve element adapted to seat thereon, an up level adjustment supply line from said source;

an up level adjustment passageway in communication between said adjustment supply line and said bypass valve and having an up level valve seat therein;

an up level adjustment valve element normally biased in a direction to seat on said up level valve seat;

valve guiding means for said valve element comprising a stem section on said check valve element and a stem section extending slidably through said bypass valve element to a position of engagement with said adjustment valve element and a bleed line in communication between said up level adjustment supply line and jointly with said bypass valve element and said bypass chamber;

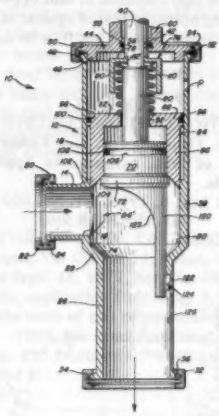
there being a two position up level solenoid valve device in said bleed line movable between an open position for said bleed line when said check valve is open and a closed position when said check valve and said bypass valve are partially open whereby to diminish the speed of up travel of said ram.

4,011,889

PISTON VALVE

Robert Lewis Smith, Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Filed Dec. 11, 1975, Ser. No. 639,746
Int. Cl.² F16K *1/00, 3/24*
U.S. Cl. 137—614.11 **5 Claims**



1. A valve for fluent materials, which may contain relatively large, unhomogeneous particulate matter, comprising: a housing having an elongated tubular wall having an inlet, a closed end, and an annular valve seat forming an outlet opposite said end a rod extending coaxially within said wall and through said end and being reciprocatable therein, a piston connected to said rod for conjoint movement with said rod coaxially within said wall between a fully extended position wherein said piston engages said seat to close said outlet and a retracted position wherein said outlet is fully opened, said piston also having a portion extending across said inlet and through said outlet and having a surface curved to deflect fluent material from said inlet through said outlet when said piston is in the retracted position, a sleeve mounted around said rod and around said piston for coaxial movement with said piston and within said wall between an extended position wherein said sleeve is disposed across said inlet to close said inlet and a retracted position wherein said inlet is fully opened, and means for biasing said sleeve toward said piston, said means moving said sleeve to resiliently close said inlet as said piston portion surface clears said outlet prior to said piston closing said outlet.

4,011,890
GAS MIXING VALVE

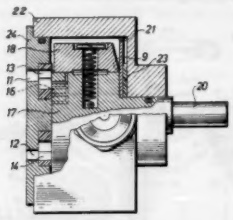
Lennart Valentin Andersson, Alvsjo, Sweden, assignor to Sjumek, Sjukvardsmekanik HB, Alvsjo, Sweden

Filed Nov. 4, 1975, Ser. No. 628,757

Claims priority, application Sweden, Nov. 25, 1974, 7414804

Int. Cl.² F16K *11/00*

U.S. Cl. 137—625.4 **8 Claims**



1. A gas mixing valve comprising a housing having two separate inlets and a common outlet, a gas dispensing device located between said inlets and said outlet and comprising an adjustable slide block formed with a plurality of substantially parallel gas channels, each having one end communicating with a selected one of said inlets and an opposite end at the outlet side, a valve flap common to said opposite ends of said channels and being normally biased against said opposite ends of said gas channels to prevent gas flow to said outlet.

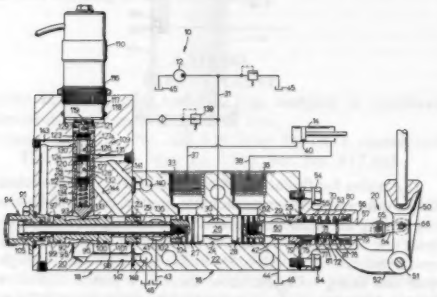
4,011,891
PROPORTIONAL FLOW CONTROL VALVE

Dale A. Knutson, Oconomowoc, and Kishor J. Patel, Hales Corners, both of Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 6, 1975, Ser. No. 602,443

Int. Cl.² F15B *9/03*

U.S. Cl. 137—625.62 **4 Claims**



1. In a servo means:

a piston movable in one direction or another from a null position to perform a function;

first and second equally sized piston areas connected to said piston;

a selectively operable pilot valve comprising first and second adjustable orifice means each having a null position and other selective positions for applying fluid pressure to said first and second piston areas, respectively, to move said piston in said one direction or another, respectively, the extent of piston movement being proportional to the amount of fluid applied;

feedback means connected between said piston and said pilot valve to maintain said piston in a position to which it is moved;

first fixed orifice means connected between said first adjustable orifice means and said first piston area to relieve fluid pressure from said first piston area when fluid pressure is being applied to said second piston area, said first fixed orifice means also serving to divert fluid from said first piston area whenever the pilot valve is not activated and thereby preventing movement of said piston from the null position;

second fixed orifice means connected between said second adjustable orifice means and said second piston area to relieve fluid pressure from said second piston area when fluid pressure is being applied to said first piston area, said second fixed orifice means also serving to divert fluid from said second piston area whenever the pilot valve is not activated and thereby preventing movement of said piston from the null position, said first and second fixed orifice means being larger than said first and second adjustable orifice means in the null position, respectively; and

biasing means acting on said piston for maintaining said piston in null position, said biasing means exerting a force on said piston which is greater than the force exerted by fluid when said pilot valve is not activated.

4,011,892
THREE PORT NON-INTERFLOW POPPET VALVE

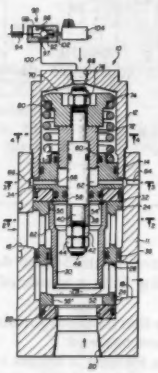
Slawomir Kowalski, Rockaway, N.J., assignor to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Mar. 14, 1975, Ser. No. 558,370

The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.² F15B *13/043*

U.S. Cl. 137—625.66 **5 Claims**



1. A valve structure for sub-sea well heads and the like including in combination a housing enclosing a valve chamber, poppet valve seats at opposite end portions of the chamber, a valve element having opposite end portions each of which comprises a poppet valve that contacts with one of the respective valve seats when the valve element is moved toward that valve seat, the valve element having a passage therethrough for the flow of fluid through the valve element from one end to the other, a partition intermediate the ends of the chamber dividing the chamber into a pressure section and an exhaust section, a guide bearing in the partition and through which the valve element slides, a seal for the guide bearing separating the sections on opposite sides of the partition from one another, pressure and exhaust ports in the housing communicating with the respective sections of the valve chamber, cylindrical wall surfaces extending from both of the valve seats in the direction of movement of the valve element and sur-

rounding each of the poppet valves closely to prevent flow of fluid past each poppet valve until the poppet valve moves beyond the end of said wall surface, the lengths of the cylindrical wall sections being correlated with the length of the valve element so that the poppet valve that is moving away from its seat reaches the end of its surrounding wall surface at approximately the same time that the poppet valve at the other end of the valve element reaches the beginning of its surrounding wall surface.

4,011,893

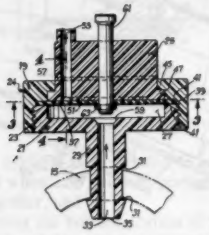
FLOW CONTROL VALVE

Clarence Bentley, 9256 Stamps Ave., Downey, Calif. 90240

Filed Feb. 3, 1975, Ser. No. 546,548

Int. Cl.² F16D *1/00*; B05B *15/00*

U.S. Cl. 138—43 **20 Claims**



1. A flow control valve adapted for use with a fluid which is subject to pressure variations, said valve comprising:

wall means for defining a valve chamber, said wall means having an interior surface defining a wall of said valve chamber, a first portion of said wall of said valve chamber having means defining a groove therein facing into said valve chamber;

inlet passage means extending from said valve chamber and defining an inlet to said valve chamber;

outlet passage means leading from said groove and terminating in an outlet and defining a port at said groove;

a resilient element having means defining on aperture therein;

means for retaining the resilient element in said valve chamber in generally confronting relationship to said groove and with the aperture being communicable with the groove whereby a flow path from the inlet to the outlet is established through said valve chamber, said aperture, and said groove;

the resilient element being resiliently to permit the pressure of the fluid in said valve chamber to resiliently deflect the resilient element into said groove an amount which increases with increasing fluid pressure in said valve chamber to thereby provide a pressure dependent restriction to fluid flow through said groove; and

said wall means including control means for moving at least one of the said resilient element and said first portion of said wall to vary the length of the groove through which the fluid flows in moving from the aperture to the outlet whereby the fluid flow rate through the groove can be adjusted.

4,011,894

FLUID FLOW CONTROL

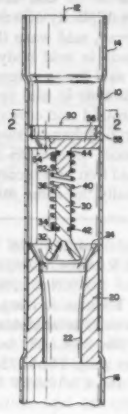
Gene A. Barnes, De Kalb, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 256,149, May 23, 1972, Pat. No. 3,837,362. This application July 10, 1974, Ser. No. 490,164

Int. Cl.² F15D *1/02*

U.S. Cl. 138—46 **5 Claims**

1. A fluid flow control for maintaining a constant flow comprising a tubular conduit fitting, a flow restrictor in said fitting, a metering pin means movably mounted adjacent to said restrictor so that movement of said pin means relative to said restrictor varies the flow through said restrictor, a resilient tension coil spring is provided for mounting said pin means, a portion of said pin means is received within said coil spring and frictionally bears against said coil spring to damp out any tendency of the spring to vibrate, said spring means



has a groove in the outer surface thereof receiving the end coil of said spring whereby said pin means is attached to said spring, said pin means creating a pressure drop thereacross which pressure drop varies proportionally with the fluid flow, said pin means being movable in response to said pressure drop whereby as said flow tends to vary said pressure drop tends to vary proportionately to maintain a relatively constant flow through said control.

4,011,895

TAPE-SUPPORTED SLIDE FASTENER ELEMENT

Ruggero Dal Negro, Via Cusani 10, Milan, Italy

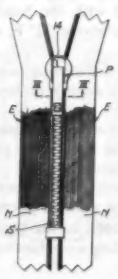
Filed Sept. 14, 1972, Ser. No. 289,063

Claims priority, application Italy, May 9, 1972, 24080/72

The portion of the term of this patent subsequent to Mar. 15, 1993, has been disclaimed.

Int. Cl.² D03D *1/00*; A44B *19/00*

U.S. Cl. 139—384 B **4 Claims**



1. a slide-fastener half comprising:

a fastener element in the shape of a continuous coil with spaced-apart turns provided at one side with coupling heads that are substantially bisected by a midplane of the coil;

a core extending longitudinally of said coil through said turns; and

a stringer tape anchored to said coil on the side thereof

opposite said coupling heads, said tape having a body disposed in a plane parallel to said midplane but offset therefrom and substantially tangent to the underside of said coil, said tape having a lower extension in said parallel plane underlying part of said coil but terminating short of said coupling heads, said tape further having an upper extension hugging part of said coil and terminating above said midplane short of said coupling heads, said tape consisting of a multiplicity of warp threads interlinked by a single weft thread, said warp threads including a set of main warp threads in said body, a set of first ancillary warp threads in said lower extension and a set of second ancillary warp threads in said upper extension, said weft thread passing around said core on the side thereof proximal to said coupling heads, said second ancillary warp threads being more numerous than said first ancillary warp threads, said first and second ancillary warp threads having substantially the same mutual spacing.

4,011,896

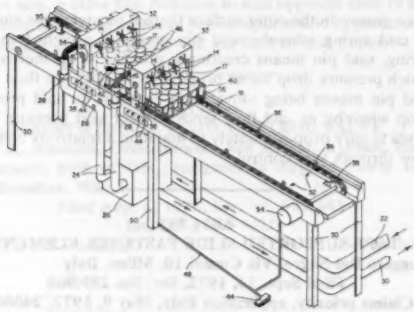
APPARATUS FOR RAPIDLY DISPENSING BEER INTO OPEN CUPS

John W. Nilon, and Thomas J. King, both of Ridley, Pa., assignors to Nilon Bros., Philadelphia, Pa.

Continuation of Ser. No. 284,103, Aug. 28, 1972, abandoned. This application Aug. 18, 1975, Ser. No. 605,435

Int. Cl.² B65B *3/04*

U.S. Cl. 141—82 **16 Claims**



1. Apparatus for simultaneous and rapid dispensing of beer into successive pluralities of open cups by cooling the beer to a sufficiently low dispensing temperature so as to permit the beer to be poured at a rapid dispensing rate without a substantial head as compared with the head typically formed at a dispensing temperature above 32° F, said apparatus comprising:

a refrigerated vessel for storing beer in substantial volume so as to provide a supply of beer to fill the successive pluralities of cups;

a plurality of side-by-side dispensing taps adapted to dispense beer into the successive pluralities of cups at the dispensing temperature;

a plurality of dispensing lines connecting said vessel with said dispensing taps so as to permit the flow of beer from the refrigerated vessel to the taps;

cooling coils for cooling a coolant to a temperature substantially below 27° F;

coolant line means connected to said cooling coils for circulating said coolant;

means for establishing a sufficiently close heat exchanging relationship between said dispensing lines and said coolant line means such that the beer flowing through the dispensing lines is cooled to a temperature below 32° F at the dispensing taps as a result of the heat exchanging relationship between the coolant and the beer;

successively arranged pluralities of side-by-side open cups; and

means for supporting said successive pluralities of side-by-side open cups beneath said dispensing taps for side-by-side filling of said side-by-side open cups from said dispensing taps with beer at a temperature below 32° F without forming a substantial head.

4,011,897

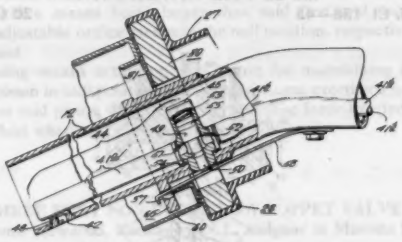
INTERLOCK SYSTEM FOR A GASOLINE DISPENSING NOZZLE

William B. Hansel, Media, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed Nov. 25, 1975, Ser. No. 635,189

Int. Cl.² B65B *57/06*

U.S. Cl. 141—207 **5 Claims**



1. A nozzle for dispensing fluid which is designed to permit operation of the nozzle only when the discharge spout of the nozzle is properly inserted into the fillpipe inlet of the tank being filled, with the discharge spout being inserted in the fillpipe a predetermined distance and the lower side of the discharge spount being urged toward the inside of the fillpipe inlet, so that in the event the nozzle falls from the fillpipe, dispensing of fluid is immediately terminated, said nozzle comprising:

a. a nozzle housing;

b. a discharge spout, connected to the nozzle housing, for insertion into the fillpipe of the tank to be filled;

c. a main nozzle valve in the nozzle housing;

d. means for controlling the position of the nozzle valve for regulating the dispensing of fluid through the nozzle housing and discharge spout, said controlling means having an enabling position wherein the position of the main nozzle valve can be regulated and a disabling position wherein the main nozzle valve remains in or obtains a closed position; and

e. interlock means, responsive to the discharge spout being inserted into the fillpipe a predetermined distance and the lower side of the discharge spout being urged toward the inside of the fillpipe inlet, for maintaining the controlling means in a disabled condition at all times except when the discharge spout is inserted in the fillpipe inlet the predetermined distance and the lower side of the discharge spout is urged toward the inside of the fillpipe inlet, thereby assuring that the nozzle cannot operated except when it is properly inserted in the fillpipe of the tank being filled and that its operation will be immediately terminated should the nozzle fall from the fillpipe.

4,011,898

WALLET-BAG

Kenneth L. Hubbard, Philadelphia, Pa., assignor to Urbane Habitats, Philadelphia, Pa.

Filed May 21, 1976, Ser. No. 688,691

Int. Cl.² A45C *3/04*

U.S. Cl. 150—35 **10 Claims**

1. A combined wallet, shopping bag, and over-the-shoulder purse comprising

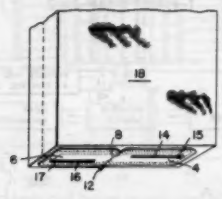
a sheet having two half portions connected together along a central crease line,

closure means operative when said two half portions of said sheet are folded over on said central crease line to hold said half portions together,

a pocket opening in at least one of said half portions of said sheet,

a foldable cloth bag having a bottom sewn to said sheet with said sidewalls extending substantially from the edges of said sheet,

foldable strap means for carrying said container,



said strap means having attachments to the sidewalls of said bag at positions remote from the bag portion attached to said sheet,

said bag being foldable and containable within the confines of said sheet when said two half portions are folded over and held together, and

said sheet forming the bottom portion of the bag when the bag is opened into operative position.

4,011,899

STEEL MEMBER FOR REINFORCING RUBBER COMPOSITIONS AND METHOD OF MAKING SAME

John M. Chamberlin, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 551,224, Feb. 19, 1975, abandoned. This application Apr. 27, 1976, Ser. No. 678,485

Int. Cl.² B60C *9/18, 9/16*

U.S. Cl. 152—361 R **7 Claims**

7. A pneumatic tire comprising a plurality of essentially rectangular steel reinforcing ribbons having a width in the range of 10 to 200 mils and a thickness in the range of 5 to 90 mils and an aspect ratio of at least 2 and being adhesively bonded therein along at least one plane wherein said ribbons are in parallel side-by-side relationship, said ribbons having an ultimate tensile strength of at least 200 KSI, a carbon content ranging from about 0.4% to about 0.9% and a heat treated and quenched microstructure of tempered martensite, bainite or mixtures thereof.

4,011,900

HATCH COVER ARRANGEMENTS

Moritz Hopland, Kleppesto, Norway, assignor to MacGregor International S.A., Basel, Switzerland

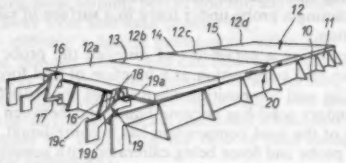
Filed Feb. 4, 1975, Ser. No. 546,874

Claims priority, application Norway, Feb. 12, 1974, 461/74

Int. Cl.² E05F *15/00*

U.S. Cl. 160—188 **7 Claims**

1. A hatch cover arrangement which comprises a cover made up of cover sections directly hinged together in series and adapted to be pivoted from an active horizontal position above a hatch coaming defining a hatch opening to an inactive, upwardly swung, vertical position at least partially outside said opening, a cover lifting device arranged in opposite relation on each exposed longitudinal side of said cover and comprising two lifting arms in combination with not more than two lifting cylinders, said lifting arms each being hingedly connected at one end to a respective one of two adjacent cover sections and at the opposite end to a hinge arm construction common to said arms which construction is separately hinged to said adjacent cover sections and a wheel mounted for the support of said hinge arm construction be-



tween the latter and said longitudinal side of said cover at the junction between said adjacent cover sections and designed for rotation along a guide extending longitudinally of said coaming, and means for actuating said not more than two lifting cylinders of said cover lifting device to cause said lifting arms to pivot the cover sections reversibly between said inactive and active positions while rotating said wheel along said guide towards and away from one end of said coaming, the common hinge construction and associated lifting arms of each cover lifting device being arranged laterally outside said guide and the locations at which said lifting arms are hingedly connected to said construction being below the level of said guide.

4,011,901

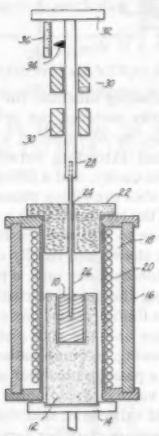
METHOD DETERMINING THE SUITABILITY OF METAL COMPOSITIONS FOR CASTING

Merton C. Flemings, Cambridge, and Kenneth P. Young, Arlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 10, 1976, Ser. No. 665,604

Int. Cl.² B22D *1/02*

U.S. Cl. 164—4 **16 Claims**



1. A process for determining the castability of a metallic composition comprising a metal matrix containing secondary solid and up to about 65 weight percent of discrete degenerate dendrites based upon the weight of said matrix which comprises:

a. heating said metallic composition,

b. contacting a probe under force to a surface of said composition,

c. determining a parameter of distance the probe travels within said composition as a function of said force.

d. said probe and force being calibrated with samples of the metallic composition to determine the range of values for said parameter which corresponds to acceptable castability of said metallic composition prior to determining the castability of said metallic composition.

9. The process of casting a metallic composition comprising a metal matrix containing secondary solid and up to about 65 weight percent of discrete degenerate dendrites based upon the weight of said matrix which comprises:

a. heating said metallic composition,

b. contacting a probe under force to a surface of said composition,

c. determining a parameter of distance the probe travels within said composition as a function of said force,

d. casting said composition when at least about 50% of said secondary solid has become liquid and between 25 and 90% of the total composition has become liquid,

e. said probe and force being calibrated with samples of the metallic composition to determine the range of values for said parameter which corresponds to acceptable castability of said metallic composition prior to determining the castability of said metallic composition.

4,011,902

DEVICE FOR PRESSURE CASTING

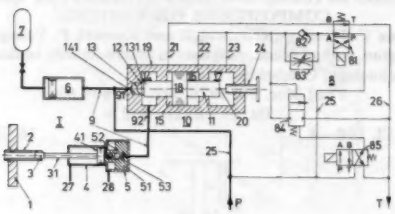
Peter Koch, Niederuzwil, and Eduard Beyer, Gossau, both of Switzerland, assignors to Gebrueder Buehler AG, Switzerland

Division of Ser. No. 511,801, Oct. 3, 1974, Pat. No. 3,964,537. This application Jan. 15, 1976, Ser. No. 649,362

Claims priority, application Switzerland, Oct. 8, 1973, 14300/73; May 3, 1975, 6026/74

Int. Cl.² B22D *17/10*

U.S. Cl. 164—314 **19 Claims**



1. In a pressure casting machine for casting, into a mold cavity, a melt quantity metered out in accordance with the volume of the cavity, by diminishing a space, receiving the metered quantity and extending between the casting gate, leading into the mold cavity, and a filling inlet in a two-phase manner including a shot pre-filling phase followed by a mold-filling phase, and of the type including a substantially horizontal shot sleeve leading to the mold cavity, an injection piston movable in the shot sleeve and fixedly connected to the shot piston of a shot-piston-cylinder unit, a pressure accumulator, means for controlling the pressure casting cycle, and a shot valve interposed in a fluid pressure line extending between the pressure accumulator and the shot-piston-cylinder unit, the improvement comprising, in combination, a valve seat in said shot valve between a passage chamber and a connection bore in said shot valve; a valve body mounted in said shot valve and cooperable with said valve seat; said shot valve being formed with at least one pressure chamber serving to press the valve body against the valve seat, a pressure fluid receiving tank; a volume governor adapted to connect each pressure chamber to said pressure fluid receiving tank, for relieving the pressure; said shot valve including at least one stroke chamber adapted to be subjected to fluid under pressure; means connecting one of said passage chamber and said connection bore to said pressure accumulator and the other of said passage chamber and said connection bore to said shot-piston-cylinder unit; and a volume-control body connected to said valve body and having a diameter decreasing in the direction of said connection bore and projecting into said connection bore; said volume-control body being connected to said valve body through a cylindrical surface of said volume-control body which cylindrical surface is short relative to the stroke of said valve body and forms, in combination with said connection bore, a sealing.

4,011,903

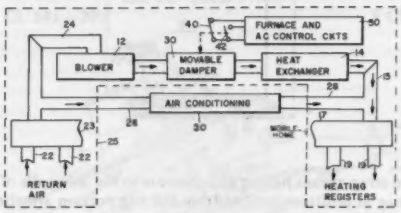
DAMPER FOR HEATING/COOLING SYSTEM

Frank Harbin, and Harry W. Slater, both of Holland, Mich., assignors to Lear Siegler, Inc., Holland, Mich.

Filed Mar. 24, 1975, Ser. No. 561,412

Int. Cl.² F24F *3/02*

U.S. Cl. 165—27 **3 Claims**



1. A damper and control for permitting use of common ducts in a heating/cooling system in which separate air forcing means are provided for a furnace associated therewith and an air conditioning unit associated therewith, said damper and control comprising:

a stationary plate mounted to the furnace in the air flow path and including a relatively large aperture extending through said plate;

a sliding plate movable between a first position which restricts the aperture of said stationary plate and a second position wherein said aperture is unrestricted;

camming means comprising an elongated cam plate with a pair of spaced flanges extending outwardly therefrom, said cam plate coupled to said sliding plate approximately parallel to the direction of motion of said sliding plate; and

electrical switch means comprising first and second electrical switches positioned to be alternately actuated by one of said flanges of said cam plate for providing a signal usable by a furnace control circuit to deactivate the furnace when said apertures are restricted by said sliding plate.

4,011,904

COMBINATION HEAT EXCHANGER AND BLOWER

Henry F. Hope, 3192 Huntingdon Road, Huntingdon Valley, Pa. 19006, and Steven F. Hope, 2548 Wyandotte Road, Willow Grove, Pa. 19090

Filed Apr. 2, 1974, Ser. No. 457,273

Int. Cl.² F28F *13/06*

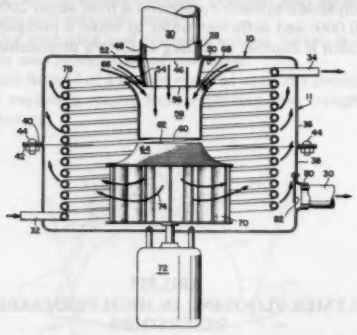
U.S. Cl. 165—108 **15 Claims**

1. In a combination heat exchanger and blower apparatus having a housing defining a chamber, a hot gas inlet into the chamber, said gas inlet having guide means for directing the air flow into said chamber, a gas outlet from the chamber, a helical heat exchanger coil mounted inside the chamber and adapted to convey a heat exchange medium, and a fan having its impeller rotably mounted within the chamber, said impeller having a suction inlet for receiving a flow of gas, and a discharge outlet for discharging the gas in a lateral direction relative to the direction of gas flow into the suction inlet, the improvement comprising:

a conduit within said housing interposed between said hot gas inlet and the suction inlet of the impeller, said conduit providing a passageway with an inlet adjacent and in alignment with the hot gas inlet into the chamber, and an outlet adjacent and in alignment with the suction inlet of the impeller, said passageway directing the flow of gases from the hot gas inlet directly to the suction inlet of the impeller,

said discharge outlet of the impeller being unobstructed by

the conduit for permitting gas to be laterally propelled from the impeller directly into the chamber;



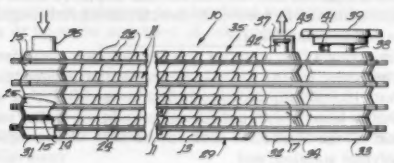
said heat exchanger coil being positioned about said conduit and said impeller to directly intercept the lateral flow of the propelled gas.

4,011,905

HEAT EXCHANGERS WITH INTEGRAL SURGE TANKS

Gregory Stephen Truscott Millard, Brampton, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 18, 1975, Ser. No. 641,807
Int. Cl.² F28D 9/00; F28F 3/08, 9/22; F01P 3/22
U.S. Cl. 165—175 20 Claims



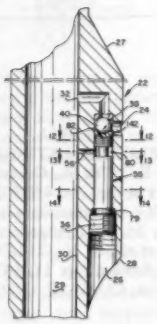
1. A heat exchange plate comprising a heat exchange portion and an extended portion, said heat exchange portion having an inlet port, an outlet port and a core portion extending therebetween an defining a flow path between the ports, and a surge chamber formed in the extended portion and adapted to communicate with said flow path.

4,011,906

DOWNHOLE VALVE FOR PARAFFIN CONTROL

Harvey C. Alexander, 610 W. 69th St., Odessa, Tex. 79762, and Ray E. Hudson, 2422 Beechwood, Odessa, Tex. 79761

Filed Oct. 31, 1975, Ser. No. 627,477
Int. Cl.² E21B 37/00, 43/00, 43/24
U.S. Cl. 166—105 9 Claims



1. In an oil well having a production string concentrically disposed within a borehole to form an annulus therebetween, a production pump at the end of the production string for pumping fluid up through the production string, a string of sucker rod leading down through the production string for actuating the pump from the surface of the ground, the improvement comprising:

a tool sub, means series connecting said sub within the production string at an intermediate position thereof;

said sub having an axial passageway formed therethrough, with the sucker rod extending through said axial passageway in spaced relationship to the side walls thereof;

an enlargement forming part of said sub and radially extending away from said axial passageway;

means defining a lateral passageway within said enlargement through which fluid can flow from said axial passageway into the casing annulus; means forming a working chamber which is in communication with said lateral passageway; a valve means positioned within said working chamber for controlling the flow of fluid through said lateral passageway;

said valve means includes a valve seat positioned within said lateral passageway, a valve element, a piston, a cylinder, and a spring means;

said valve element normally being forced into sealing engagement with said valve seat to prevent flow through said passageway, said piston having opposed ends with one end thereof being engaged against said valve element, said piston being reciprocatingly received in sealed relationship within said cylinder with said spring means being located within said cylinder and forced into engagement with the end of said piston which is opposed to said valve element, adjustment means by which said cylinder is forced towards said valve seat to thereby vary the biasing force of said spring means;

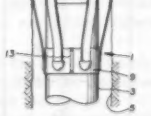
said end of said piston which is reciprocatingly received within said cylinder includes a reduced diameter marginal portion arranged such that said piston and cylinder form a variable chamber therebetween; means forming a bleed passageway from said axial passageway into said variable chamber; said lateral passageway includes an outlet which is formed between said piston and said valve seat so that when said valve element is displaced from said seat, flow can occur from said axial passageway, through said lateral flow passageway, including said seat, and into the annulus.

4,011,907

KNOCKDOWN CENTRALIZER

Henry J. Clay, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 19, 1975, Ser. No. 642,264
Int. Cl.² E21B 17/10
U.S. Cl. 166—241 10 Claims



1. In a knockdown centralizer of the type having at least two separate end collars with a plurality of openings therein for receiving a plurality of spring bands in non-welded interlocking fulcrumed engagement with said end collars, the improvement comprising:

a. inwardly projecting lug means, attached to opposite end portions of each of said spring bands, for providing arcuate inner longitudinal interlock surfaces;

b. arcuate inner longitudinal surfaces of said end collars

defining opening means, in said end collars, for receiving and longitudinally restraining said lug means while allowing rotation between said lug means and said opening means; and

c. an overlying means, connected to each of said end collars, for partially radially overlying said opening means and radially inwardly restraining said lug means within said opening means.

4,011,908

MICELLAR FLOODING PROCESS FOR RECOVERING OIL FROM PETROLEUM RESERVOIRS

LeRoy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 376,530, July 5, 1973, abandoned, and a continuation-in-part of Ser. No. 466,540, May 3, 1974, abandoned. This application May 6, 1975, Ser. No. 575,020

Int. Cl.² E21B *43/22*

U.S. Cl. 166—273 **20 Claims**

1. In the method for recovering petroleum from a subterranean reservoir in which a micellar solution is injected into the reservoir through an injection well in communication therewith, and thereafter an aqueous flooding medium is injected to drive the micellar solution towards one or more spaced production wells from which fluids are recovered, the improvement which comprises injecting into said reservoir prior to the injection of said micellar solution an aqueous alkaline alkali metal silicate pretreating solution having a M_2O/SiO_2 molar ratio of between about 1 and 4, wherein M is an alkali metal atom.

4,011,909

METHOD OF USING CEMENTING COMPOSITION HAVING IMPROVED FLOW PROPERTIES

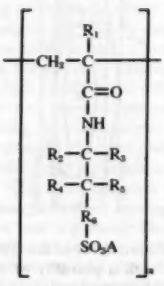
Sally Lee Adams, Pittsburgh; Fred David Martin, McMurray, both of Pa., and Michael M. Cook, Boxford, Mass., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 610,197, Sept. 4, 1975, which is a division of Ser. No. 465,936, May 1, 1974, Pat. No. 3,936,408. This application Jan. 29, 1976, Ser. No. 653,576

Int. Cl.² E21B *33/13*

U.S. Cl. 166—293 **10 Claims**

1. In the method of cementing a well comprising the step of pumping an aqueous hydraulic cement slurry into place in the annular space between the well casing and the well bore-hole, the improvement comprising employing therein an aqueous hydraulic cement slurry composition having improved flow properties comprising hydraulic cement in admixture with from about 0.01 to about 5.0 percent by weight, based on weight of hydraulic cement on a dry basis, of a polyamido-sulfonic compound having recurring units represented by the following formula:



wherein R_1 is hydrogen or methyl; R_2, R_3, R_4, and R_5 are each independently selected from the group consisting of hydrogen, phenyl, straight or branched alkyl of from one to twelve carbon atoms, and cycloalkyl of up to six carbon atoms; R_6 is straight or branched alkyl of one to twelve carbon atoms, cycloalkyl of up to six carbon atoms, phenyl, or is absent; A is hydrogen, alkali metal ion or ammonium; and n is an integer of from 2 to about 100, such that the weight average molecular weight of the polyamido-sulfonic compound is from about 200 to about 10,000; and sufficient water to make a pumpable slurry which is capable of setting to form a monolithic solid.

4,011,910

POLYMER FLOODING IN HIGH PERMEABILITY RESERVOIRS

John S. Rhudy; William B. Gogarty; Bruce L. Knight, Littleton; and James H. Fullinwider, Aurora, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed June 13, 1973, Ser. No. 369,642

Int. Cl.² E21B *43/22*

U.S. Cl. 166—274 **1 Claim**

1. In a process of recovering hydrocarbon from a hydrocarbon-bearing subterranean formation having a stratum(s) which has a permeability greater than 500 md and having at least one injection means in fluid communication with at least one production means and wherein an aqueous polymer solution is injected into the stratum and displaced toward the production means to recover hydrocarbon therethrough, the improvement comprising:

(1) injecting a first aqueous polymer solution comprised of a polymer having an average molecular weight greater than 10,000,000 and the molecular weight being sufficiently large to substantially effect a permeability reduction of the formation rock to the flow of the aqueous polymer solution, and

(2) then injecting a second aqueous polymer solution comprised of an N-sulfohydrocarbon-substituted acrylamide polymer having an average molecular weight less than 10,000,000 and the molecular weight being sufficiently low to not substantially effect a further permeability reduction of the formation rock but the molecular weight being sufficiently large to impart increased viscosity to the second aqueous polymer solution for favorable mobility control in the displacement of hydrocarbon from the formation.

4,011,911

PORTABLE FIRE EXTINGUISHER

Quinn W. Gow, 251 E. 157th St., Gardena, Calif. 90248

Continuation-in-part of Ser. No. 455,978, March 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 257,201, May 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 217,793, Jan. 14, 1972, abandoned. This application July 11, 1975, Ser. No. 595,059

Int. Cl.² A62C *37/30*

U.S. Cl. 169—29 **9 Claims**

1. A fire extinguisher comprising:

a. hollow housing means for storing a fire extinguishing composition;

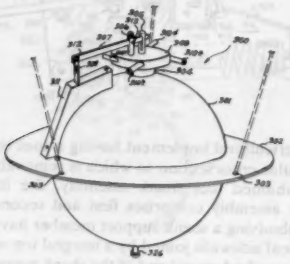
b. rotatable means in communication with the interior of

said housing means for dispersing said composition in response to a predetermined condition;

c. frangible sealing means disposed between said housing means and said rotatable means;

d. means for rupturing said frangible sealing means in response to said predetermined condition;

e. link means formed of a fusible material normally preventing said rupturing means from rupturing said frangible sealing means;



f. trigger means removably engaged with said link means and normally retaining said link means in said rupture preventing condition; and

g. means for actuating said trigger means in response to said predetermined conditon, to cause said trigger means to become disengaged from said link means, so that said rupturing means will be released upon the melting of said link means in response to a localized temperature condition or upon the actuation of said trigger means.

4,011,912

UNEARTHING DEVICE FOR HARVESTING GROUND VEGETABLES, SUCH AS TURNIPS

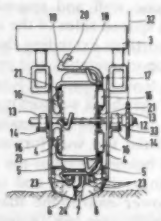
Mattheus-Willem Verplanke, Ijzendijke, Netherlands, assignor to Wilhelm Stoll Maschinenfabrik GmbH, Lengede-Broistedt, Germany

Filed Sept. 10, 1975, Ser. No. 612,207

Claims priority, application Germany, Sept. 12, 1974, 2443609

Int. Cl.² A01D *19/02*

U.S. Cl. 171—101 **6 Claims**



1. In a digging device for a single-or-multiple-row turnip harvesting machine having at least one unearthing share which consists of two unearthing share halves, conveyor elements provided in the zone above and laterally beside the unearthing share halves, said conveyor elements being rotatably driven about an axis which lies transversely to the direction of travel and extending approximately parallel with the ground and being provided with conveyor teeth and in which each laterally define a turnip conveying channel, the conveyor teeth of said conveyor elements moving in conveying direction in the area of the unearthing shares, the improvement comprising wherein for both unearthing share halves the conveyor teeth are constructed as conveyor arms supported pivotally and spaced laterally from one another in radial bearing sleeves mounted on a common hub against the force of a spring element, whereby, starting from one bearing sleeve, the radially extending section of the conveyor arm changes at a selected distance from the axis of the hub into an axially parallel lever arm section which extends from one hub side to the other hub side, to which lever arm section is connected a section which projects approximately radially and in the direction of rotation slightly forwardly, the outer end of said section has a catch section which is bent against the direction of rotation of the conveyor arms and slightly toward the turnip conveying channel.

4,011,913

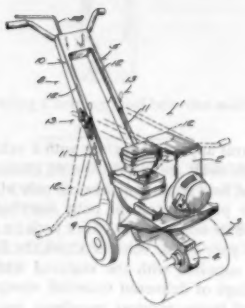
TILLER WITH FOLDING HANDLE AND CLUTCH CONTROL

John W. Davies, III, Plymouth; Edward W. Enters, Fredonia, and Eugene A. DuPas, Plymouth, all of Wis., assignors to Gilson Bros. Co., Plymouth, Wis.

Filed Feb. 23, 1976, Ser. No. 660,127

Int. Cl.² A01B *33/02, 33/08;* **B62D** *51/04*

U.S. Cl. 172—42 **10 Claims**



1. In a tiller having an engine, a tine assembly, and a clutch mechanism having an operative state completing a drive connection from said engine to said tine assembly and an inoperative state interrupting that drive connection, the improvement of

a folding handle comprising:

a lower elongated portion,

an upper elongated portion,

and connecting means joining said upper and lower portions and operative to selectively clamp said upper and lower portions against relative movement and in a position with their respective longitudinal axes generally aligned and further operative to release said upper portion for limited longitudinal movement with respect to said lower portion sufficient to release said upper portion for pivotal movement thereof relative to said lower portion,

and a clutch control connected to and operative to switch said clutch mechanism being said operative and inoperative states, said clutch control comprising:

first elongated rod means,

means connecting said first rod means to said upper handle portion for movement therewith and relative thereto,

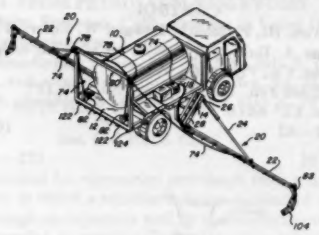
motion transmitting means operatively associated with and movable to establish the operative and inoperative states of said clutch mechanism,

and means for operatively connecting said first rod means to said motion transmitting means so that movement of said first rod means relative to said upper handle portion is transmitted to said clutch mechanism to establish selectively the operative and inoperative states of said clutch mechanism and further operative to interrupt said operative connection of said first rod means and said motion transmitting means when said upper handle portion has been moved longitudinally sufficient to release said upper handle portion for pivotal movement.

4,011,914
FIELD MARKING SYSTEM

Willard Owen Elmer, P.O. Drawer C, Indianola, Nebr. 69034

Filed Nov. 22, 1974, Ser. No. 526,147
Int. Cl.² B05B 1/20; A01B 49/06
U.S. Cl. 172—126 2 Claims



1. Agricultural apparatus for use with a vehicle for delivering a material, such as a fertilizer or pesticide, along two parallel spaced field paths, one at each side of the vehicle and along another parallel central path therebetween, and for marking the outer edges of the entire path on the field so that upon the next pass of the vehicle across the field a like entire path may be supplied with the material without substantial voids or overlaps of delivered material, comprising:

a. a pair of boom support members, each being rigidly affixable to an opposite side of the vehicle and between its ends,

b. each boom support member being mounted for major pivotal movement about a first axis lying in a substantially vertical plane adjacnet one side of the vehicle and disposed at a forwardly and upwardly median acute angle of the order of 40° to 60° relative to the forward direction of the vehicle,

c. a boom supported by each of the boom support members with means securing the inner or proximate end of each boom to its support member for minor limited pivotal movement about a second axis substantially normal to said first axis,

d. a field marker carried by the outer end of each boom constantly supporting each end against downward gravitational movement and as limited by the depth of a continuous furrow formed thereby in the soil,

e. each marker being so constructed to engage an obstacle in the soil, such as a rock or the like, and pass over same, swinging the boom about said first axis in a rearward and upward direction about said first axis, the boom swinging forwardly and downwardly to its normal operative position after the marker has passed over the obstacle, said second axis permitting minor swinging of the boom thereabout independent of movement thereof about said first axis,

f. each marker being caster mounted to the end of its boom for free rotation about a substantially vertical axis and disposed rearwardly of its caster axis to permit it to pivotally trail the boom and follow a curved path equidistant from a curved path of the vehicle,

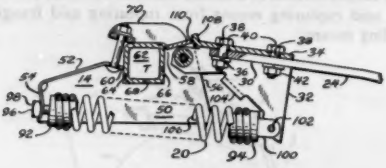
g. fixed material distributing means rigidly affixable to the rear end of the vehicle substantially parallel to the booms and of a length substantially that of the distance between the inner ends of the booms for distributing the material to said central path,

h. said first axes permitting the booms to be swung to transport positions substantially normal to their operative positions in which they are disposed at upwardly and rearwardly angles of said 40° to 60°.

4,011,915
TOOL SHANK MOUNTING ASSEMBLY

Charles W. Anderson, Kewanee, Ill., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Nov. 10, 1975, Ser. No. 630,418
Int. Cl.² A01B 61/04
U.S. Cl. 172—265 6 Claims

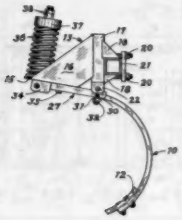


1. In an agricultural implement having a tool bar of generally rectangular cross section to which is removably mounted a spring-cushioned tool shank assembly, the improvement wherein the assembly comprises first and second units, the first unit embodying a shank support member having a pair of spaced vertical sidewalls joined by a integral top wall having a lip portion over the forward end of the shank support member, said top wall containing a generally rectangular shaped opening intermediate its forward and rear ends and said side walls each having a cutout in the upper edge thereof below said opening, said cutouts and opening together defining a tool bar receiving recess in which the forward and rear side edges are spaced apart to closely engage the tool bar received therein, the rear edges of said cutouts having a height approximating the corresponding cross sectional dimension of said tool bar and the forward edges of said cutouts having a height approximately at least half said cross sectional dimension, a clamp arm having a forward portion overlying said recess and a depending rear portion having spaced walls straddling the side walls of the shank support member behind said cutouts, a pivot pin pivotally connecting said straddling walls of the clamp arm to the shank support member behind its tool bar receiving recess, and bolt means releaseably securing the forward end of the clamp arm to the top wall of the shank support member forwardly of said recess, the underside of the forward portion of the clamp arm snugly engaging the top surface of the tool bar upon tightening of the bolt means to rigidly secure the assembly to the tool bar, first unit further embodying a channel-shaped shank holding member having a forwardly inclined base wall and spaced generally parallel depending sides, said spaced sides of the shank holding member having forward portions extending through the open rear end of the shank support member and pivotally mounted on said pivot pin, and a tension spring at least partially confined within the interior of the shank support member below its tool bar receiving recess, one end of said tension spring being fixed to the lip portion of the top wall forwardly of the tool bar receiving recess and below the pivot pin on which the shank holding member swings, the other end of the tension spring being fixed to the lower end of the shank holding member below and behind said pivot pin, comprising a tool shank embodying a leaf spring having a forwardly curved lower end portion to which is replaceably connected a soil engaging tool point, said tool shank having a straight end portion which is detachably bolted to the base wall of the shank holding member of the first unit, the sides of the shank holding member of the first unit having forwardly disposed outwardly turned flange portions which engage with the rear edge of the shank support member sidewalls below and behind the pivot pin under the tension of the spring member to define the working position of the soil engaging tool point, the forward end of the shank holding member base wall constituting a second stop spaced above said pivot pin which engages the rear edge of the top wall of the shank support member to limit the angular swing of the shank and its soil engaging tool point, said second unit including the tool shank and its soil engaging tool point being readily detachable from the first unit for ready replacement without disconnecting the spring or disturbing the relationship of the members of the first unit.

4,011,916
CHISEL PLOW MOUNT

Archie Neal, and Paul Moore, both of Garfield, Wash., assignors to Love Company, Garfield, Wash.

Filed July 11, 1975, Ser. No. 595,020
Int. Cl.[2] A01B 65/00
U.S. Cl. 172—710 7 Claims



1. A chisel plow mount for agricultural implements, comprising:

a forwardly protruding mounting bracket adapted to be fixed to a tool bar;

a transverse horizontal pivot shaft fixed across the lower portion of the mounting bracket;

a forwardly protruding shank retainer in the form of a downwardly-facing channel with longitudinal flanges projecting downward from a central web, the web having a pivotal connection with said pivot shaft at its upper surface adjacent the rearward end of the shank retainer;

a bent chisel plow having a forwardly projecting shank at its upper end overlying the web within the area bounded by said flanges;

a transverse clamping bar across the lower surfaces of the flanges of the shank retainer and the shank radially below the pivot shaft;

means for fixing the forward end of the shank to the shank retainer at a position forward from the pivot shaft;

upright compression spring means supported on the mounting bracket at a location above the forward end of the shank retainer;

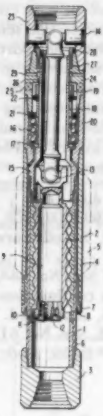
and tension means operatively connected between the forward end of the shank retainer and the upper end of the upright compression spring means for resisting downward movement of the forward end of the shank retainer by the compression of said compression spring means.

4,011,917
PROCESS AND UNIVERSAL DOWNHOLE MOTOR FOR DRIVING A TOOL

Wladimir Tiraspolsky, 69 au VichnBrenson, 92130 Issy-les-Moulineaux, France, and Roger Francois Rouviere, Quartier les Ribel, 13770 Venelles, France

Continuation of Ser. No. 498,701, Aug. 19, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,494
Int. Cl.[2] E21B 3/12
U.S. Cl. 175—107 18 Claims

1. Downhole motor for driving an earth-boring tool, supported from a drill stem and comprising a helicoidal shaft and a tubular body having a helicoidal lining, said shaft and body comprising two helicoidal gears located within each other, comprising K and K+1 teeth respectively, arranged for creating an encapsulation of a given pitch direction, said shaft being located within said tubular body, means for mounting said shaft in order that it is angularly fixed, but free to undergo a nutating movement, a casing rigidly secured to said drill stem, upper and lower radial bearing means and thrust bearing means for rotatively mounting said body within said casing, means for connecting said tool with said rotating body, and

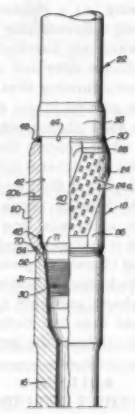


means for supplying a driving fluid between said shaft and said tubular body.

4,011,918
STABILIZER FOR DRILL STRINGS

Rainer Jürgens, Celle, Germany, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Jan. 21, 1976, Ser. No. 650,897
Int. Cl.[2] E21B 17/10; E21C 9/00
U.S. Cl. 175—325 16 Claims



1. A rotary drill string stabilizer apparatus for use in rotary drilling of a bore hole; comprising a body structure having first connecting means adapted to secure such structure in a tubular running string, said body structure including a body member having a conical outer surface and a passage therethrough through which drilling fluid from the tubular running string can flow, a stabilizer comprising a stabilizer sleeve having a conical inner surface matching the conical configuration of said conical outer surface of said body member, said stabilizer sleeve being mounted on said body member with said conical outer and inner surfaces in friction contact, longitudinally spaced peripheral seals preventing fluid leakage between said inner and outer surfaces from the region between said seals, means for conducting fluid under pressure to the region between said conical inner surface and conical outer surface and between said seals to expand said sleeve and enable said sleeve to be moved relatively longitudinally along said conical outer surface to shrink-fit said sleeve on said body member upon relieving of the fluid pressure, said sleeve having a projecting

portion at the small diameter end of said conical inner surface extending laterally inwardly toward the axis of said body member, said body member having second connecting means at the small diameter end of said conical outer surface, a companion member secured to said second connecting means and bearing against said projecting portion to exert a compressive force thereon urging said sleeve in a direction toward the large diameter end of said conical outer surface, the co-engaging bearing surfaces of said projecting portion and said companion member being of substantial radial extent and disposed substantial normal to the axis of said body member, stabilizer sleeve, and companion member.

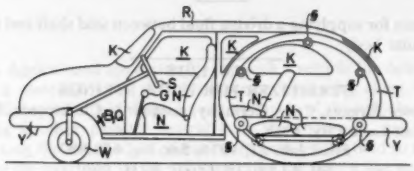
4,011,919
TIREROLLER

Theodore Oskar Groeger, 2 Collamore Circle, West Orange, N.J. 07052

Continuation-in-part of Ser. No. 444,007, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 343,732, April 19, 1973, abandoned. This application Sept. 25, 1975, Ser. No. 616,574

Int. Cl.² B60K *1/00, 3/00*

U.S. Cl. 180—1 R **32 Claims**



1. A vehicle comprising: a) a chassis having on opposite sides at least three bearing rolls rotatably mounted on substantially horizontal axles, which are distributed over substantially the periphery of said chassis-sides and connected therewith; b) a pair of annular, elastic running tires, the outer surface of each tire contacting the ground in use and the inner surface contacting said rolls at each chassis-side, which tires are so deformed by said rolls when bearing the vehicle's weight on the ground, that each tire has several different radii of curvature, all of which remain larger than any of the rolls' radii of curvature, and the rolls' distance above the ground is larger than the tires' thickness; c) at least one stabilizer contacting the ground in use, which is resiliently and rotatably connected with another side of said chassis; d) power means operatively connected with said vehicle and e) braking means operatively connected with said vehicle and only a lower front bearing roll, whereby, when said tires are braked, the area of said outer tire surface which contacts the ground is increased.

4,011,920
SYNCHRONIZED VEHICLE FLUID DRIVE SYSTEM

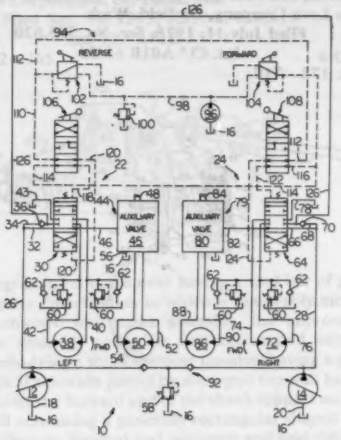
Donald L. Bianchetta, Coal City, and Jesse L. Field, Jr., Braidwood, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 25, 1975, Ser. No. 607,511

Int. Cl.² B62D *11/04*

U.S. Cl. 180—6.48 **5 Claims**

1. A synchronized vehicle fluid drive system comprising:
a vehicle;
a pair of motors operative to drive the opposite sides of said vehicle;
a pair of pressure supplying fluid pumps;
a pair of open loop circuits individually communicating one of said pumps with one of said motors through an open center distributor valve for operation thereof, each of said circuits also having a supply conduit with a load check valve therein upstream of said distributor valve, and
a synchronizing line disposed in fluid communication between said supply conduits of said open loop circuits connectably intermediate each of said load check valves and said distributor valves at the opposite ends thereof for



equalizing fluid flow to said motors and to assure straight line travel of said vehicle when desired.

4,011,921
APPARATUS FOR GUIDING WARM AIR OBTAINED AFTER COOLING OF AN ENGINE IN A MOTORIZED TWO-WHEELED VEHICLE

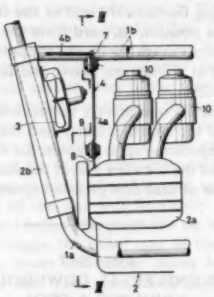
Tuneaki Sakamoto, Shiki, and Takeshi Hashimoto, Tachikawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1975, Ser. No. 609,059

Claims priority, application Japan, Sept. 4, 1974, 49-105599

Int. Cl.² B62D *63/04*

U.S. Cl. 180—33 R **6 Claims**

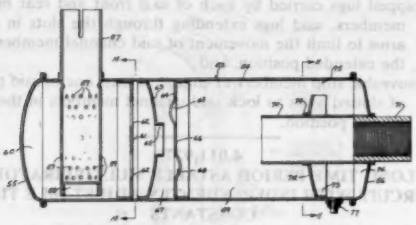


1. In a two-wheeled vehicle having a body, an internal combustion engine mounted on the body, and a blower means for cooling the engine, an improvment comprising a guide plate adjacent the blower means to direct warm air obtained after cooling outside the vehicle body, said engine being of water-cooled type and including a radiator mounted on the body in front of the engine, said blower means being on said radiator at the rear thereof in adjacent facing relation with said engine, said guide plate being between said engine and said blower means, said guide plate including a vertical portion rearwards of said blower means and a horizontal portion extending above said blower means, the body having spaced pipes above the engine, said vertical portion of the guide plate extending downwardly from the pipes, said horizontal portion extending forwardly said pipes.

4,011,922
MUFFLER CONSTRUCTION

Gary Dennis Goplen, Monona, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed July 18, 1975, Ser. No. 597,030
Int. Cl.² F01N *1/08, 3/06*
U.S. Cl. 181—57 **11 Claims**

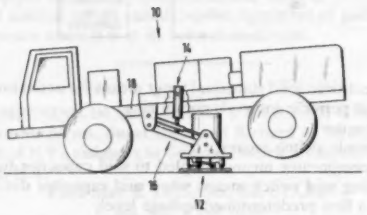


1. A muffler for an internal combustion engine, comprising a housing having an exhaust gas inlet and an exhaust gas outlet, a pair of baffle members disposed in generally parallel spaced relation within said housing with the space between said baffle members defining an intermediate chamber, the upstream baffle member having an opening for the passage of exhaust gas and said downstream baffle members having a closed portion disposed in alignment with said opening in the upstream baffle member, the spacing between said baffle members is less than the diameter of said opening, and outlet means disposed in said downstream baffle member between said closed portion and the periphery of said downstream baffle member, said outlet means providing communication between said intermediate chamber and said outlet.

4,011,923
MOBILE SEISMIC ENERGY SOURCE

Herbert Talke, Laatzen; Gerhard Müller, Sehnde, and Jürgen Schmidt, Bolsehle, all of Germany, assignors to Prakla-Seismos GmbH, Hannover, Germany

Filed Sept. 9, 1975, Ser. No. 611,672
Claims priority, application Germany, Mar. 6, 1975, 2509704
Int. Cl.² G01V *1/04*
U.S. Cl. 181—114 **10 Claims**



1. A vehicular system for imparting seismic energy to a ground surface, the system defining a vehicular mass and comprising:

A. A vehicle chassis for supporting front and rear axles;

B. A vibrator type seismic energy source having a base plate for imparting seismic energy to the ground surface;

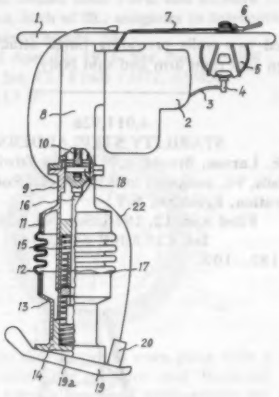
C. An under-chassis frame pivotally mounted to said chassis intermediate said axles for supporting said energy source under said chassis and intermediate said axles, the frame including at least one arm and a corresponding bracket, the arm having first and second ends pivotally connected to the chassis and to the bracket respectively, wherein the bracket is supportably coupled to the energy source and provides therefor a pivot point with said second end; and

D. A lifting mechanism adjustably extending under said chassis, including only a single, fluid operated jack having one end pivotally connected to the chassis and another end pivotally coupled to the one arm intermediate the bracket and the chassis, for advancing the frame to positions relatively away-from and adjacent-to the chassis to thereby advance the base plate into and out of ground engagement respectively, whereby pressure from at least part of said vehicular mass is transferred to said base plate when the frame is in said away-from position.

4,011,924
DEVICE FOR PRODUCING MECHANICAL WAVES

Maurice Barbier, Ousse, France, assignor to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed Oct. 1, 1974, Ser. No. 511,013
Claims priority, application France, Oct. 15, 1973, 73.37807
Int. Cl.² G01V *1/14*
U.S. Cl. 181—121 **14 Claims**



1. A seismological apparatus for generating terristrial compressions having variable time intervals therebetween comprising:

a. a percussion mass,

b. means for driving said percussion mass to strike a ground surface intermittently thereby causing impacts at a repetition rate in the range of 0.5 to 100 Hz,

c. said impacts being terrestrially transmitted as waves of compression,

d. means for varying the repetition rate of said impacts, said means operable during the intervals between said impacts, and

e. first sensing means for providing a signal representing times of occurrences of said impacts.

4,011,925
STETHOSCOPE

Alan French, Warwick, and George Winthrop Torrey, West Barrington, both of R.I., assignors to Avid Corporation, East Providence, R.I.

Filed Jan. 23, 1976, Ser. No. 651,640
Int. Cl.² A61B *7/02*
U.S. Cl. 181—131 **5 Claims**

1. A stethoscope fabricated as a unitary structure comprising:

a. a body having a left wing and a right wing,

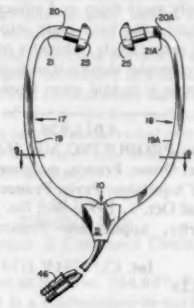
b. a left arm provided with a channel having two walls,

c. friction joint means between one of said two walls and said left wing,

d. the other of said two walls providing hinge attaching means between said left arm and said body,

e. a right arm provided with a channel having two walls,

friction joint means between one of said last mentioned two walls and said right wing, the other of said last mentioned two walls providing hinge attaching means between said right arm and said body.

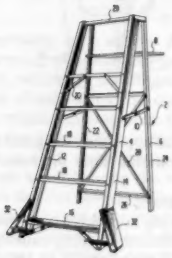


4,011,926

STABILITY STEPLADDERS

Clayton E. Larson, Brooklyn, N.Y., and Edwin H. Lemp, Bellows Falls, Vt., assignors to White Metal Rolling & Stamping Corporation, Brooklyn, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,391
Int. Cl.² E06C *5/36, 7/42*
U.S. Cl. 182—107 **6 Claims**



1. A stepladder having high stability against lateral tilting comprising:

a front section including a pair of side rails with a bottom step and a plurality of other spaced apart steps fixed between the side rails;

a rear propping section including a pair of side rails and brace members for holding the side rails in spaced apart relation, said rear propping section being pivoted to said front section;

a pair of channel members each comprising a central web and a pair of integral front and rear webs extending normally from the central web, said front and rear webs being longer than the central web forming a pair of lugs upon one end of each channel member;

the inside distance between said front and rear webs of said channel members being substantially equal to the width of the side rails of said front section;

a padded foot member fixed transversely of each channel member at the end opposite to said lugs;

said channel members being pivoted by said lugs to said side rails above said bottom step to swing outwardly from said side rails between a closed position and an extended position, the pivot point for said channel members being such that said padded foot members extend in both said closed and said extended positions beyond the lower end of said front section side rails;

front brace members angled at each side of said front section between the forward edge of each side rail and the forward edge of said bottom step;

rear brace members angled at each side of said front section between the rearward edge of each side rail and the rearward edge of said bottom step;

a pair of front and a pair of rear slotted arms pivoted upon said front and rear webs respectively of each channel member;

capped lugs carried by each of said front and rear brace members, said lugs extending through the slots in said arms to limit the movement of said channel members in the extended position, and

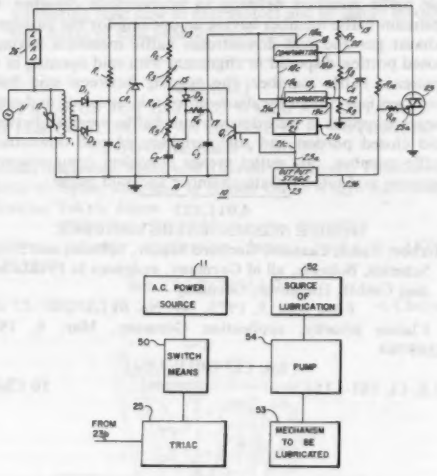
moveable stop members to engage at least one of said pairs of slotted arms to lock said channel members in the extended position.

4,011,927

LONG TIME PERIOD ASTABLE MULTIVIBRATOR CIRCUIT WITH INDEPENDENTLY ADJUSTABLE TIME CONSTANTS

Carl H. Smith, Spring Valley, N.Y., assignor to Auto Research Corporation, Rochelle Park, N.J.

Filed Mar. 7, 1975, Ser. No. 556,204
Int. Cl.² B61D *15/00;* **H03K** *5/13*
U.S. Cl. 184—26 **11 Claims**



1. Electronic solid state dual timer means for activating load means at periodic intervals comprising:

a capacitor;

electronic switch means;

first comparator means coupled to said capacitor for activating said switch means when said capacitor discharges to a first predetermined voltage level;

second comparator means coupled to said capacitor for deactivating said switch means when said capacitor charges to a second predetermined level higher than said first predetermined level;

charging means coupled to said switch means for charging said capacitor at a first rate when said switch means is activated, said charging means including a first resistor means for controlling the charging rate of said capacitor;

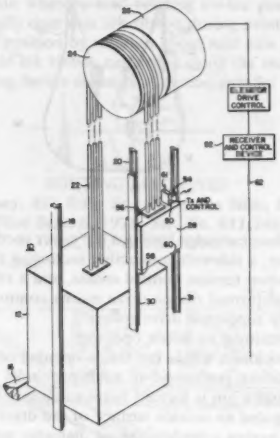
discharging means coupled to said switch means for discharging said capacitor at a second rate when said switch means is deactivated, said discharging means including second resistor means for controlling the discharging rate of said capacitor;

said first and second resistor means having different magnitudes of ohmic value.

4,011,928
ELEVATOR SYSTEM

Richard M. Spear, Jersey City, and Lawrence P. Tosato, Millburn, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1975, Ser. No. 584,431
Int. Cl.² B66B *13/24*
U.S. Cl. 187—29 R **9 Claims**

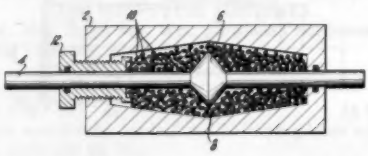


1. An elevator system, comprising:
a movable component,
motive means for driving said movable component,
guide means for guiding said movable component in a vertical path,
detector means operable from a first to a second condition in response to a predetermined horizontal movement of said movable component,
transmitter means carried by said movable component, said transmitter means providing an output signal only when said detector means is in its first condition,
and receiver means remote from said movable component responsive to said transmitter means, said receiver means including control means operable from a first to a second condition when said receiver means fails to receive an output signal from said transmitter means,
said control means modifying the operation of said motive means when it is in its second condition.

4,011,929
DAMPENING DEVICE USING A SILICONE RUBBER

Edward M. Jeram, Burnt Hills, and Richard A. Striker, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed May 2, 1975, Ser. No. 573,827
Int. Cl.² F16F *9/30*
U.S. Cl. 188—268 **11 Claims**

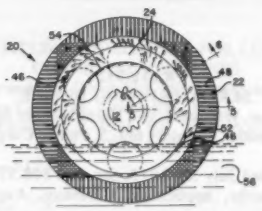


1. In a damper comprising a closed chamber, a movable piston rod extending through said chamber, an enlarged piston head on said rod, a compressible solid mass under pressure and located within said chamber for producing a damping force on said rod and piston head, a bypass means associated with said piston head providing for transfer of said compressible solid mass therethrough, and a means for varying the pressure of the compressible solid mass in said chamber within a pressure range required to produce damping on said rod, the improvement which comprises utilizing as said solid, an unfilled silicone rubber composition produced by curing a composition comprising 0.1–2.0 parts of peroxide catalyst to 100 parts of a polymer composition consisting of 95–99.5 mole % of dimethyl siloxane units, 0.05–2.0 mole % of methyl vinyl siloxane units, 0.001–5.0 mole % of trimethyl siloxane units, and said silicone rubber composition being fragmentable into particulate form after curing.

4,011,930
MEANS TO PRESENT LUBRICATING AND COOLING FLUID TO FRICTION MATERIAL IN A WET BRAKE SYSTEM

Robert R. Coons, Indian Head Park, and Richard G. Hennessey, Oak Lawn, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 12, 1976, Ser. No. 676,098
Int. Cl.² F16D *13/72, 65/853*
U.S. Cl. 192—113 B **15 Claims**

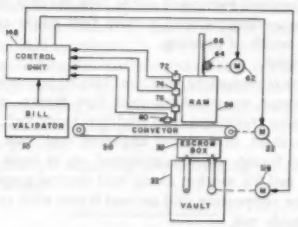


1. In a friction disc having a core plate with a centrally disposed axle receiving aperture and frictional material bonded thereto for use in a fluid environment the improvement comprising:
a fluid baffle ring, being a thin flat ring of inelastic material significantly wider than its own thickness, bonded face-to-face to the core plate of the friction disc inboard of the friction material.

4,011,931
BILL ESCROW AND STORAGE APPARATUS FOR VENDING MACHINE

James Kenneth Wyckoff, San Diego, Calif., assignor to Cubic-Western Data, San Diego, Calif.

Filed Feb. 13, 1976, Ser. No. 657,882
Int. Cl.² G07F *7/04*
U.S. Cl. 194—4 C **12 Claims**



1. Bill escrow and storage apparatus, comprising:
a validator unit for validating paper money bills and having an outlet through which each accepted bill is ejected;
a track attached to said validator unit to receive bills therefrom, said track being elongated and having a handling station spaced from the validator unit;

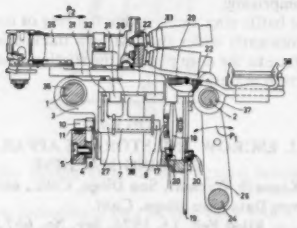
conveyor means mounted in said track for moving a bill from the validator unit to said handling station;
an escrow box mounted adjacent said handling station;
said escrow box having retaining means for holding a bill therein;
transfer means mounted at said handling station for transferring a bill from said track into said escrow box;
a vault mounted adjacent said escrow box;
actuating means coupled to said transfer means for selectively transferring a bill into said escrow box and from said escrow box into said vault;
ejection means coupled to said escrow box for selectively ejecting a bill therefrom;
said track has an opening therein at said handling station;
said transfer means comprising a ram reciprocally movably mounted on the side of the track opposite said escrow box;
and said actuating means driving said ram through the opening to push a bill from said track into said escrow box.

4,011,932

SERIAL PRINTING DEVICE

Horst Wurscher, Wilnsdorf, and Horst-Werner Bach, Kirburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 23, 1975, Ser. No. 598,178
Claims priority, application Germany, Aug. 13, 1974, 2438735
Int. Cl.² B41J *19/00*
U.S. Cl. 197—82 **10 Claims**



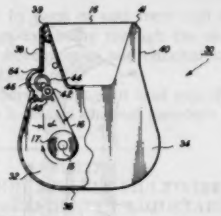
1. In a serial printing device, an improved mounting and transport mechanism for a printing head, comprising
first and second elongated guide rails parallel to each other,
a rack extending parallel to said first guide rail across an entire width of printing,
a first frame,
means for transporting said first frame, comprising an electric motor mounted on said first frame, a drive shaft extending transversely to said first guide rail, and a pinion on the shaft, said pinion engaging said rack,
a second frame slidably mounted on at least said second guide rail for motion along said second guide rail,
means for supporting said second frame with respect to said first guide rail,
means for mounting a printing head on said second frame, and
means for interconnecting said first and said second frames for relative motion, comprising a bearing bushing mounted in one of the frames, and a pin rigidly mounted in the other frame transversely to said guide rails and slidably fitted in said bearing bushing.

4,011,933

RIBBON DRIVE MEANS

Jack L. Kern, Arlington, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1975, Ser. No. 619,547
Int. Cl.² B41J *33/26*
U.S. Cl. 197—151 **10 Claims**



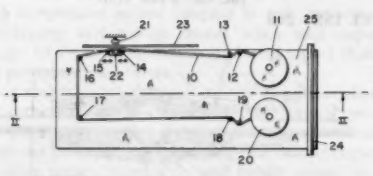
1. In a ribbon cartridge having a top cover section, a bottom cover section, a sidewall connecting section, a ribbon supply means, a ribbon tension control means, and a ribbon take-up means, the improved ribbon drive means comprising:
a rotatably supported drive roller;
a ring containing an inside opening;
a post positioned within the inside opening of the ring, the post further positioned in such proximity to the drive roller that a nip is formed between an outside surface of the ring and an outside surface of the drive roller;
said post having a predetermined diameter sufficiently less than a predetermined diameter of the inside opening of the ring to permit the ring to pivotally move with respect to the nip as well as rotate in cooperation with the drive roller;
said ribbon, as it passes from the ribbon supply means to the ribbon take-up means, passes around a predetermined portion of the outside surface of the ring and then through the nip, whereby said ribbon, upon rotation of the drive roller, causes the ring to pivot with respect to the nip causing a wedging action between the ring and the drive roller at the nip and against the ribbon at the nip, with the rotational movement of the drive roller and the ring cooperating to advance the ribbon through the nip.

4,011,934

INK RIBBON AND PIVOTABLE HIGH SPEED PRINTING DEVICE MOVABLE FROM PRINTING TO NON-PRINTING POSITION

Bernt Inge Lennart Ploby, Jarfalla, and Erik August Wilhelmsson, Stockholm, both of Sweden, assignors to Facit Aktiebolag, Atvidaberg, Sweden

Filed Oct. 30, 1975, Ser. No. 627,084
Claims priority, application Sweden, Nov. 4, 1974, 7413814
Int. Cl.² B41J *33/02*
U.S. Cl. 197—154 **5 Claims**



1. In an ink ribbon arrangement for a high speed printer having a printing device movable in a given direction with respect to a recording medium, a pair of spools, an ink ribbon extending between said spools, and ribbon guides positioned

to direct said ink ribbon between said spools in a path which extends past said printing device; the improvement comprising a first means mounting said spools and said ribbon guides to form a single frame unit, and a second means pivoting said frame unit for rotation about an axis perpendicular to said given direction, said second means including means including an electromagnet mounted and arranged to move said frame unit to a printing position by rotation about said axis, with the lengthwise direction of said ribbon extending inclined to said given direction whereby said printing device passes substantially diagonally over said ink ribbon during printing, and in a non-printing position by rotation about said axis whereby the portion of said ink ribbon extending along the recording path of said printing device assumes a position parallel to said given direction.

4,011,935

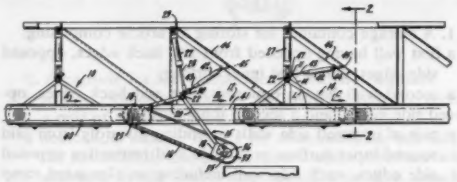
SORTING MACHINES

John P. Massey, 421 Ruby St., Clarendon Hills, Ill. 60514

Filed Sept. 8, 1975, Ser. No. 611,146

Int. Cl.² B65G *47/64*

U.S. Cl. 198—365 **6 Claims**



1. A sorting conveyor apparatus for sorting a variety of articles of indefinite configuration comprising a tandem series of sequentially arranged combination conveyordischarge stations, each station comprising:

a station frame mounted for movement in two opposed directions between a conveyor position, in which the frame is aligned with the adjacent stations both fore and aft, to convey articles therebetween, and a discharge position in which one end of the frame is displaced from the adjacent station to discharge an article entering the station;

a conveyor section mounted on the frame and extending longitudinally for substantially the full length of the station frame;

actuator means for moving the frame between its conveyor position and its discharge position;

and shock absorber means being connected at one end to the frame and at the other end to a fixed support, said shock absorber means having an extendible and compressible element constructed to offer substantially no resistance to frame movement during initial movement out of one position and up to a predetermined point whereafter said element retards movement of the frame until the other position is reached, in both directions.

4,011,936

CONVEYOR POSITIONING STRUCTURE FOR LOADING AND CONVEYING MACHINES

Henry C. Hall, Green Bay, Wis., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed Jan. 2, 1976, Ser. No. 646,044

Int. Cl.² B65G *41/02*

U.S. Cl. 198—517 **16 Claims**

1. In a machine for loading and conveying loose material such as rocks and the like:

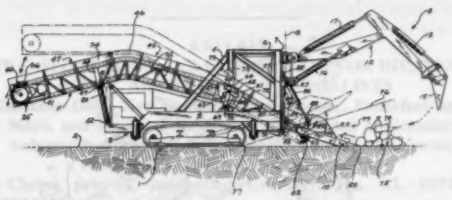
a. transport means for supporting and moving said machine on the ground, ,

b. a machine frame carried by said transport means,

c. material gathering means connected to the front portion of said frame,

d. an elongated conveyor extending from the front to the rear of the machine,

e. an apron disposed at the front of the machine and having a bed extending forwardly from above the front portion of said conveyor for transfer of material from said gathering means to said conveyor,



f. means mounting the rear portion of said apron for pivotal movement about a transverse horizontal axis,

g. means pivotally mounting the front portion of said conveyor to said apron,

h. and means for vertically adjusting said apron so that the said front portion of said conveyor is simultaneously vertically adjusted.

4,011,937

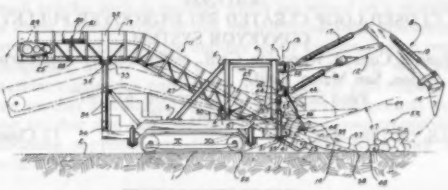
APRON ATTITUDE ADJUSTMENT FOR LOADING AND CONVEYING MACHINES

Sheldon J. Brandtjen, Green Bay, Wis., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed Jan. 2, 1976, Ser. No. 646,011

Int. Cl.² B65G *41/02*

U.S. Cl. 198—517 **12 Claims**



11. In a machine for loading and conveying loose material such as rocks and the like:

a. transport means for supporting and moving said machine on the ground,

b. a frame carried by said transport means,

c. material gathering means mounted to the front portion of said frame,

d. an elongated inclined conveyor extending from the front to the rear of the machine,

e. an apron disposed at the front of the machine and extending forwardly from adjacent the front portion of said conveyor for transfer of material from said gathering means to said conveyor,

f. means mounting the rear portion of said apron for pivotal movement about a transverse horizontal axis,

g. means for pivoting said apron about said axis for selective engagement or disengagement of the front apron portion with the ground,

h. and means for adjusting said mounting means and said axis vertically.

4,011,938

SUSPENSION IDLER

Arthur F. Kain, 1726 Virginia Court, Lakeland, Fla. 33803

Filed Sept. 8, 1975, Ser. No. 611,312

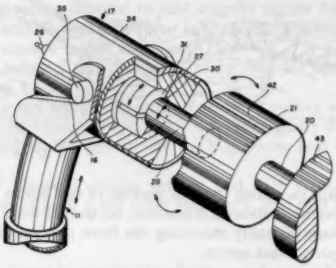
Int. Cl. B65g *15/08*

U.S. Cl. 198—824 **13 Claims**

1. A conveyor idler comprising:

a. an elongated, flexible, solid molded polymer idler member having a plurality of rollers formed thereon each roller having a friction surface molded therein, said idler member having a pair of enlarged end portions molded thereon;

b. a pair of terminal supports, each said terminal support



having a pair of polymer members shaped to enclose one said enlarged end portion of said conveyor idler and a casing holding said pair of polymer members therein; and

c. mounting means attached to each said terminal support for mounting said terminal support to a conveyor idler support framework whereby a conveyor may be supported by a one-piece flexible and rotatable idler.

4,011,939

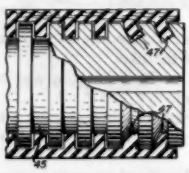
CLOSED LOOP CLEATED BELT/GROOVED PULLEY CONVEYOR SYSTEM

René A. Conrad, Woodside, Calif., assignor to Dynaloc Corporation, San Mateo, Calif.

Filed Sept. 26, 1975, Ser. No. 616,907

Int. Cl.² B65G 15/62

U.S. Cl. 198—840 **11 Claims**



1. A closed loop conveyor system comprising:

a generally cylindrical drive pulley and a generally cylindrical return pulley, at least one of said drive and return pulleys having a plurality of annular grooves of predetermined depth formed in its outer surface along a portion of its axial length with some of said grooves being inclined and formed by a pair of spaced-apart frusto-conical side surfaces and a bottom surface; and

a conveyor belt disposed around said drive and return pulleys and including a carcass having an exterior load-carrying surface and an interior surface with a plurality of integrally formed, spaced-apart, groove-engaging cleats protruding therefrom, said cleats being aligned in at least one row formed in the direction of belt travel, said cleats being elongated in the row direction and having a predetermined height slightly larger than said predetermined depth, whereby said cleats engage said bottom surface and cause said internal surface to remain out of frictional contact with said outer surfaces as said belt passes around said pulleys.

4,011,940

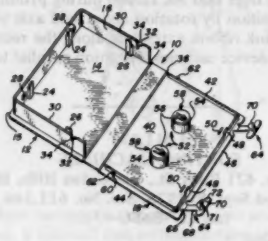
HINGED STORAGE CONTAINER FOR TAPE CARTRIDGE WITH SELF-ALIGNING WALLS

Lloyd D. Neal, Redwood City, and Allan R. Northrup, Cupertino, both of Calif., assignors to Amaray International Corporation, San Jose, Calif.

Filed Dec. 12, 1975, Ser. No. 640,037

Int. Cl.² B65D 43/16, 51/04, 85/67

U.S. Cl. 206—1.5 **2 Claims**



1. A storage container for storing an article comprising:

a first wall having opposed front and back edges, opposed side edges, and a first inner surface;

a second wall having opposed front and back edges, opposed side edges, and a second inner surface;

a pair of opposed side walls extending inwardly from said second inner surface proximate said respective opposed side edges, each side wall including an elongated ramp declined toward said second inner surface and terminating in a notch;

a front wall extending inwardly from said second inner surface proximate said front edge and connecting said side walls;

a back wall including first and second hinges connected to said respective back edges such that said first inner surface is capable of being moved into a facing relationship relative to said second inner surface, said first and second hinges being formed of a resilient material and serving to normally bias said first and second walls apart, said first, second, back, front and side walls serving to form an enclosure for storing an article when said front edges are aligned;

a first rib extending inwardly from said first inner surface a distance from said side edges and said front edge that is slightly greater than that corresponding to the location of said side and front walls such that said first rib is enclosed by said side and front walls when said walls are formed into said enclosure;

a pair of rigid second ribs, each being molded to a respective outer surface of said first rib in alignment with said notches when said walls are formed into said enclosure, and having a ramp-engaging surface whereby when said inner surfaces are moved into a facing relationship said ramp-engaging surfaces engage said ramps, and whereby continued movement forces said ramp-engaging surfaces to slide relative to said ramps and into engagement with said respective notches, said movement serving to correspondingly move said second wall to a location such that said respective front edges of said first and second walls are aligned;

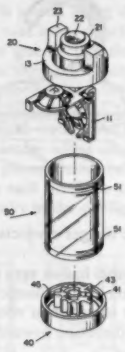
a pair of third ribs each extending inwardly from said first inner surface at locations outside and parallel to respective ones of said first ribs, said first and third ribs serving to capture said side walls when said walls are formed into said enclosure; and

latching means for securing said first, second, back, front and side walls into said enclosure when said front edges are aligned.

4,011,941
CONTACT LENS CAPSULE

Frederick L. Parsons, Ridgewood, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 28, 1975, Ser. No. 572,551
Int. Cl.² A45C *11/00*; B08B *3/04*
U.S. Cl. 206—5.1 **15 Claims**

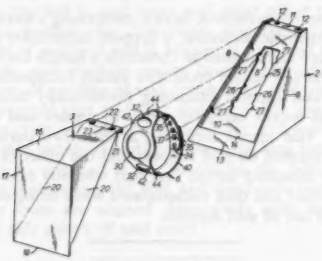


1. A capsule for soft contact lenses which comprises:
a hollow, cylindrical body of sufficient diameter to receive a pair of contact lenses;
a detachable closure means for attachment to one end of the hollow body and able to form a water proof seal when attached to the body, and having a catalyst attached thereto;
a second removable closure means for attachment to the other end of the hollow body and having at least one passageway extending therethrough and terminating at its outer end and in an annular truncated conical groove.

4,011,942
WRISTWATCH DISPLAY CASE HAVING DETACHABLE FLEXIBLE WATCH-SUPPORTING CUFF

Louis John Crosslen, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed Feb. 24, 1976, Ser. No. 660,866
Int. Cl.² B65D *5/50*, *1/34*
U.S. Cl. 206—45.14 **12 Claims**

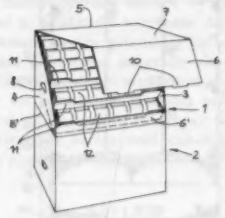


8. In a display case for a device having a flexible band defining a loop:
a wall having a slot therethrough for receiving said band,
said slot having a pair of notches near each end thereof,
each notch in each pair being disposed in a side edge of said slot,
and a flexible cuff for insertion within said loop for releasably supporting said device on said wall,
said cuff having two spaced-apart portions and each portion being wider than said slot but narrower than the combined width of said slot and a pair of notches adjacent an end of said slot whereby said portion is able to pass through said slot and said pair of notches,
and wherein said portion has slits on opposite sides thereof for engagement with the side edges of said slot adjacent said notches.

4,011,943
TRANSPORTATION AND DISPLAY CASE FOR HOLDING SMALL ARTICLES SUCH AS PRALINES

Giordano Galli, Neu Isenburg; Inge Hansen, Frankfurt am Main, and Friedrich Reichert, Steinbach, all of Germany, assignors to Ferrero GmbH, Frankfurt am Main, Germany

Filed Jan. 14, 1976, Ser. No. 649,003
Claims priority, application Germany, Jan. 22, 1975, 2502502
Int. Cl.² B65D *5/50*, *5/52*
U.S. Cl. 206—44 R **14 Claims**

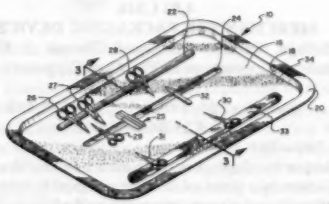


1. A transportation and display case for holding individual small articles such as pralines which are stored on a plurality of levels, characterized in that the individual small articles are arranged adjacent to one another ready for removal on trays comprising at the upper and lower side of their side wall sections connecting parts which are staggered with respect to one another and adapted to be brought into engagement with one another and the rear wall of the container comprising mounting supports providing the individual trays with an inclined position.

4,011,944
DISPOSABLE SURGICAL EQUIPMENT TRAY

Denton A. Cooley; Charles C. Reed, both of Houston, and Russell G. Sharp, Sugar Land, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Filed Nov. 17, 1975, Ser. No. 632,337
Int. Cl.² B65D *1/34*, *25/14*
U.S. Cl. 206—557 **1 Claim**



1. A tray for surgical instruments comprising:
a unitary molded tray constructed of rigid plastic and comprising a recessed base, a raised sidewall extending around the entire periphery of the base and a laterally extending lip contiguous with and projecting from the sidewall, the sidewall laterally extending lip configurated to nest within a conventional Mayo stand ring;
at least one elongated upstanding ridge formed on the unitary molded tray and at least one elongated recess formed

in the unitary molded tray, each of the ridge and recess facilitating finger access of instruments placed thereon; and

a thin layer of organic, cellular, sponge-like material which is absorbent and sterilizeable, the sponge-like material being bonded over the entire exposed upper surface of the tray, including each ridge and recess.

4,011,945

FIRST AID EQUIPMENT

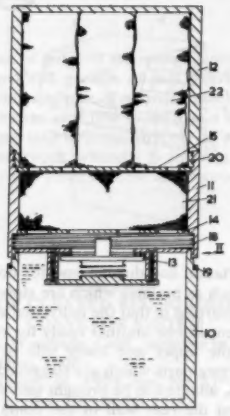
Edmund Alexander Bourne, Farnborough, and James Gerard Fitzgerald, London, both of England, assignors to National Research Development Corporation, London, England

Filed Sept. 9, 1975, Ser. No. 611,686

Claims priority, application United Kingdom, Sept. 13, 1974, 40128/74

Int. Cl.² A61B *19/02;* **B65D** *69/00*

U.S. Cl. 206—223 **15 Claims**



1. A first aid kit for treating burns to human or animal tissue and comprising a reservoir for water and a compartment or compartments containing absorbent dressing and non-toxic endothermic reactor, the reservoir being normally sealed from the compartment or compartments but being rapidly openable to allow water into the compartment or compartments, and the arangement being such that when the kit is charged the reservoir may be opened to allow water to the compartment or compartments at will to be cooled by reaction with the reactor and to be absorbed by the dressing.

4,011,946

MERCHANDISE PACKAGING DEVICE

Sidney Savage, Canton, Ohio, and Thomas J. Ham, Stone Mountain, Ga., assignors to The Akro Corporation, Canton, Ohio

Filed Nov. 24, 1975, Ser. No. 634,415

Int. Cl.² B65D *85/00*

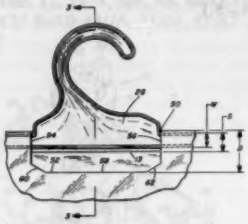
U.S. Cl. 206—284 **1 Claim**

1. A device for displaying floor mats and the like in vertical position wherein a sheet of flexible material is folded to form two side panels and a connecting web and wherein the web has a circular opening and wherein a hanger has a central portion which extends upwardly through the opening and terminates in a hook and has a pair of arms extending outwardly from the central portion which engage the underside of the web, and wherein the side panels receive the mat to be displayed, wherein the improvement comprises,

the connecting web has a slot adjacent the mid portion thereof and one of the side panels has a slot which communicates with the slot in the web,

the hanger has an elongated flat central portion together with arms which extend in opposite directions from the central portion,

the arms of the hanger occupy the space between the connecting web and the upper edge of the mat and the central portion of the hanger projects through the slot in the web, and



the slot in the side panel has an area sufficient to receive the flat central portion of the hanger, whereby the hanger together with the arms when rotated can be positioned downwardly in a direction toward said panel.

4,011,947

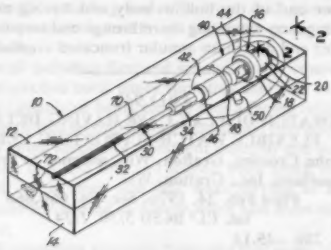
PACKAGED PROSTHETIC DEVICE

Philip Nicholas Sawyer, 7600 Ridge Blvd., Brooklyn, N.Y. 11209

Filed May 22, 1975, Ser. No. 579,791

Int. Cl.² A61F *1/22;* **B65D** *85/54*

U.S. Cl. 206—363 **28 Claims**



1. A protected prosthetic device comprising a sterilized and cleaned prosthetic structure, a support detachably engaging said structure and adapted to constitute a handle for the same, and hermetically sealed protective means encapsulating said structure, said support extending hermetically through said means, said means being openable to render said structure accessible, said means including at least two parts, one of which is mounted on said support and the other of which is detachably mounted on the first part whereby said structure can be cleaned and then encapsulated while being maneuverable by the use of said support.

4,011,948

EGG CRATE

Houston Rehrig, Pasadena, and Bud E. Sanders, North Hollywood, both of Calif., assignors to Rehrig Pacific Company, Los Angeles, Calif.

Continuation of Ser. No. 321,591, Jan. 8, 1973, abandoned. This application July 7, 1975, Ser. No. 593,253

Int. Cl.² B65D *21/01*

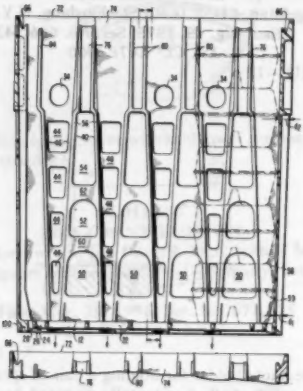
U.S. Cl. 206—507 **13 Claims**

1. An egg crate comprising:

a generally rectangular bottom panel having first, second, third and fourth edges,

first, second, third and fourth upstanding side panels attached to said bottom panel, respectively along said first, second, third and fourth edges with said first and said third side panels, and said second and said fourth side panels, respectively, being opposite one another,

said first and third side panels each having an upper portion and a lower portion, each of said lower portions comprising a plurality of alternating inner and outer substantially planar offset panels joined along their adjacent edges by elongated flanges, said inner offset panels being disposed in a first side plane intersecting the plane of said bottom panel and being inclined outwardly with respect thereto, said outer offset panels being disposed in a second side plane intersecting the plane of said bottom panel, the bottom edges of said outer offset panels being spaced outwardly of the bottom edges of said inner offset panels, said second side plane being inclined outwardly at a greater angle than said first side plane, said inner offset panels being generally in the configuration of an isosceles



trapazoid with the longer of the two parallel sides comprising the bottom edge thereof, said outer offset panels being generally in the shape of an isosceles trapazoid with the shorter of the two parallel sides comprising the bottom edge thereof, said flanges being generally perpendicularly oriented with respect to said first and second side planes, each of said upper portions comprising a wall in a plane substantially perpendicular to said bottom panel and attached to said inner and outer offset panels, said upper portion also comprising stacking means on the inside of said wall and in alignment with said inner offset panels, said stacking means being engageable with the bottom of another of said crates when said other crate is so oriented that said first and third side panels of said other crate are aligned respectively with said third and first side panels of said crate, said stacking means further being so oriented as not to engage the bottom of said other crate when the first and third side panels of said other crate are aligned respectively with the first and third side panels of said crate.

4,011,949

PACKAGE CONSTRUCTION FOR OPENING ONLY BY A PREDETERMINED PROCEDURE

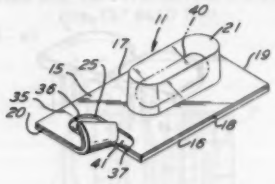
Robert J. Braber, and Paul L. Weber, both of Harleysville, Pa., assignors to The Lehigh Press, Inc., Harleysville, Pa.

Filed June 18, 1975, Ser. No. 588,067

Int. Cl.² B65D *83/04*

U.S. Cl. 206—532 **4 Claims**

1. A package construction for opening only by a predetermined process comprising a generally flat carrier layer having a through cut-out located in spaced relation within the boundary of the carrier layer to define a hole, a blister formation on said carrier layer spaced from said cut-out and opening to one side of said carrier layer, and a relatively flexible closure layer on said one side of and in facing engagement with said carrier layer extending across and in closing relation with both said blister and cut-out, said carrier and closure layers being releasably adhesively secured together throughout the entire extent of their facing engagement for maximum strength and



resistance to blister opening except by the predetermined procedure, and a weakened severance line formed in said carrier and closure layers extending between spaced edge locations of said layers and generally chordally across said cut-out, for deliberate manual separation along said severance line to expose for intentional grasping only a closure layer portion retained with a straight severance edge relatively taut in position extending across said cut-out between spaced bounding edge regions of said hole.

4,011,950

CIGARETTE MONITORING APPARATUS

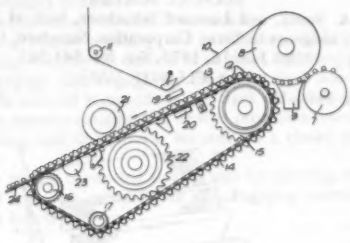
Robert W. McLoughlin, Belfast, and Colin P. Nuttall, Bangor, both of Northern Ireland, assignors to Gallaher Limited, Belfast, Northern Ireland

Filed Sept. 19, 1975, Ser. No. 614,790

Claims priority, application United Kingdom, Sept. 23, 1974, 41326/74

Int. Cl.² B07C *5/344*

U.S. Cl. 209—73 **9 Claims**



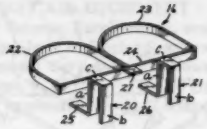
1. Apparatus for monitoring the assembly of filter tipped cigarettes, said apparatus comprising: means for continuously advancing a succession of assembled cigarettes transversely to their length through an optical device; said optical device including at least two transmitters for transmitting beams of light across the plane of movement of the cigarettes at different angular orientations relative to the movement plane, each beam being interrupted by each advancing cigarette for a time depending on the effective transverse dimension of the cigarette as seen by that beam, and photosensitive elements for receiving the beams of light from said transmitters and for providing a signal corresponding to the time during which the respective beam of light is interrupted; and signal combining means coupled to said photosensitive elements and responsive to the combined magnitude of the signals of said photosensitive elements for responding to a defective cigarette if the combined magnitude of said signals is outside a predetermined range.

4,011,951

BRACKET FOR SMALL ANIMAL FEEDER

Richard J. Boyer, Rte. No. 1, Eagle Bend, Minn. 56446

Filed Feb. 2, 1976, Ser. No. 654,619
Int. Cl.² A47G *29/00*; A47K *1/08*; A01K *5/01*
U.S. Cl. 211—71 **1 Claim**



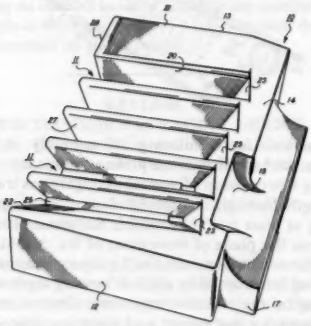
1. A mounting bracket comprising, in combination:
a pair of hook members each in the form of an inverted U sized to fit over the upper edge of a rail member and comprising a pair of spaced leg portions joined by a body portion;
a bar secured orthogonally at spaced points there along to first legs of said hook members near said body portions;
hoop members secured to said bar in side-by-side relation to extend from said bar in a direction away from said hook members;
lip members secured to said first legs of said hook members near the free ends thereof to extend in the same direction of said hoop members, so that an object such as a feed bucket placed within a hoop member may rest on a lip member;
and means secured to said bar between said hook members and extending from said bar in the direction of the bodies of said hooks, for resting on the top of a rail member.

4,011,952

MANUAL SORTER

Craig A. Smith, and Leonard Schachner, both of Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 16, 1975, Ser. No. 541,543
Int. Cl.² B42F *7/10*
U.S. Cl. 211—10 **12 Claims**



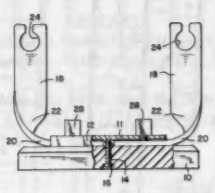
1. A manual sorter apparatus, said sorter having a plurality of sheet receiving bins arranged one behind the other in a substantially horizontal direction from a front portion to a rear portion of said sorter, said sorter further including a first side portion extending between said front and rear portions, each of said bins defining a sheet receiving opening at a top portion of said sorter, said top portion extending between said side, front, and rear portions, each of said bins having a first surface for supporting a side of said sheet, said first surface extending downwardly and rearwardly from said top portion, and outwardly and forwardly from said side portion of said sorter, each of said bins further having a second surface for supporting a first edge of said sheet, said second surface extending downwardly from said top portion, and a third surface for supporting a second and different edge of said sheet, said third surface extending outwardly and upwardly from said side portion, said sorter being adapted to be positioned with said first side portion adjacent a sheet output device of a reproducing machine with said front to back arrangement of said bins being in a direction transverse to the direction in which sheets are fed into said output device. surfaces, said opening allowing small foreign objects to exit from said bins.

4,011,953

SPECTACLE RACK

Stefan Engelman, 61-38 164th St., Flushing, N.Y. 11365

Filed Aug. 15, 1975, Ser. No. 606,342
Int. Cl.² A47F *7/00*
U.S. Cl. 211—13 **5 Claims**



1. A spectacle holder for holding a pair of spectacles comprising, a substantially horizontally disposed base portion, a slotted channel member integral with and horizontally disposed on the upper surface of said base portion, said channel member defining a slot extending inwardly from opposite ends of said channel member, a pair of arms each having a base portion and an upper portion, each arm base portion adapted to slide independently in said channel member and being slideably mounted within said slot from said opposite ends and an aperture in each of the upper portions of said arms each adapted to receive a portion of said spectacles, said apertures being disposed within the same plane and spaced apart a distance substantially equal to the distance between said upper portions of said arms.

4,011,954

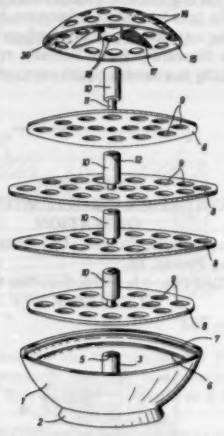
DISPLAY STAND

Giordano Galli, Larchenweg 15, 6078 New-Isenburg, Germany

Filed Aug. 10, 1973, Ser. No. 387,377
Claims priority, application Germany, Aug. 11, 1972, 2239682
Int. Cl.² A47G *19/28*
U.S. Cl. 211—14 **9 Claims**

1. A display stand comprising
an upper domed portion, said portion having a plurality of holes therein for receiving objects to be inserted therein,
a bottom portion in the shape of a bowl,
a plurality of article supporting plates and spacer elements, removably mounted in stacked condition between said bottom portion and said upper portion, and
means formed on said upper and bottom portions for providing for an interfitting engagement therebetween so

that said supporting plates and spacers can be removed and said upper domed portion can be disposed in direct



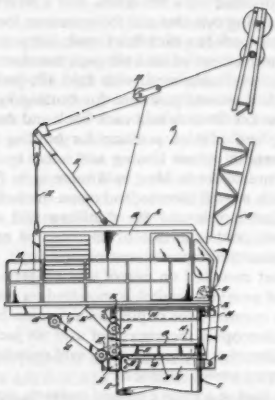
interfitting engagement with said lower portion to form a holder structure.

4,011,955

SEA CRANE TIEDOWN

James G. Morrow, Sr., and David J. Pech, both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Mar. 29, 1976, Ser. No. 671,315
Int. Cl.² B66C *23/52*
U.S. Cl. 212—3 **3 Claims**



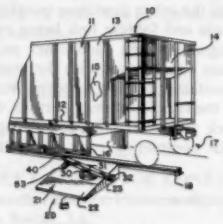
1. In a sea crane including a cylindrical pedestal supporting a roller path on which is rotatably mounted an upper works having a bed carrying a boom at one end and supporting a counterweight at the other end, the improvement comprising, in combination, an annular collar fixed around said pedestal well below said roller path, an arcuate stop bar suspended from said bed so as to hang beneath said collar and adjacent said pedestal, said bar being out of contact with both said pedestal and said collar and being on the side of the pedestal opposite said boom, a strap anchored at its ends to the ends of said bar and embracing said pedestal beneath said collar, said strap being out of contact with both said pedestal and said collar, and a plurality of tension links coupling said bed and both said bar and said strap so that, in the event of structural failure, said upper works cannot be pulled or tilted beyond the points where said stop bar or said strap engage said collar.

4,011,956

CLOSURE MECHANISM FOR BOTTOM DUMP HOPPER CARS

Dan R. Green, Portage, and Ernest J. Nagy, Munster, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Aug. 15, 1975, Ser. No. 605,104
Int. Cl.² B61D *7/30*
U.S. Cl. 214—63 **10 Claims**



1. For a hopper car having a hopper positioned between a pair of side sills,

door means supported on said car for hinging movement on longitudinal axis parallel to said sills from an open substantially vertical position to a closed substantially horizontal position beneath said hopper, the improvement comprising:

a door means closing mechanism including a support stationarily positioned to one side of a track on which said car is positioned,

a closing arm including means supporting said arm for rotating movement about a vertical axis on said support whereby said arm is movable in a generally arcuate path around said axis,

actuating means movably connected to said arm to extend and retract lengthwise relative to said arm during pivotal movement thereof,

engageable means on said door means,

indexing means engaging and positioning said actuating means whereby the same is in an initial actuating position to engage said engageable means on said door means when said car is moved on said track alongside said support thereby rotating said arm to provide a lateral force moving said door means inwardly to a closed position, and

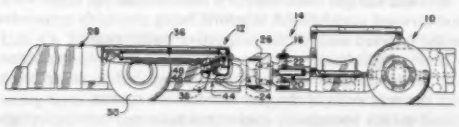
motor means connected to said arm for rotating said arm and actuating means again into engaging position with said indexing means.

4,011,957

FOLDING EJECTOR LINKAGE FOR MATERIAL HANDLING MACHINERY

Randall R. Bendtsen, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 16, 1976, Ser. No. 649,874
Int. Cl.² B60P *1/00*
U.S. Cl. 214—82 **26 Claims**



1. An ejector assembly for a hauling vehicle of a type having a relatively fixed container portion and a movable container

portion, motor means being operable to move the movable container portion into a first position for forming an enclosure to receive a load, the motor means also being operable to move the movable container portion from its first position for unloading of the vehicle, the ejector assembly comprising

an ejector element being arranged in a retracted position within the movable container portion in said first position.

bracket means mounted upon the ejector element,

jack means including an extendable and retractable component, and

a folding link pivotably connected with the jack means,

the jack means being pivotably connected with one container portion and the folding link being pivotably connected with the other container portion,

the jack means and folding link being extended toward a parallel alignment with each other and the jack means entering into engagement with the bracket means as the movable container portion is moved from its first position relative to the fixed container portion, thereby conditioning the jack means to subsequently operate the ejector element for completing removal of the load from the vehicle.

4,011,958

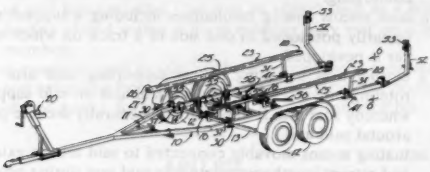
BOAT TRAILER

Lawrence K. Carrick, Spokane, Wash., assignor to Calkins Manufacturing Company, Spokane, Wash.

Filed Aug. 4, 1975, Ser. No. 601,916

Int. Cl.² B60P 1/52

U.S. Cl. 214—84 **7 Claims**



1. A boat trailer for carrying a shallow keel type sailboat having a central elongated keel of substantial weight and a hull having a front bow and a contoured lower hull configuration formed along the respective sides of the keel, comprising:

a wheel supported framework having a forward end adapted for connection to a towing vehicle;

bow securing means mounted to the forward end of the framework for selective engagement of the bow of a boat while in a loaded position on the trailer;

a plurality of keel rolls rotatably mounted to the framework along the longitudinal central portion thereof, said keel rolls being adapted to engage and support the keel of a boat;

elevated longitudinal bunk means movably mounted to the framework along opposite transverse sides of the keel rolls, said bunk means having forward and rear ends, each bunk means comprising an elongated normally horizontal member of flexible material having a upwardly facing areal hull-engaging surface for flexibly bending to conform to the lower hull configuration of a boat at the sides of its keel and for preventing lateral tipping of a boat while in a loaded condition on the trailer;

forward upright bunk supports mounted to the framework, said forward upright bunk supports being pivotably connected to the forward ends of the respective bunk means;

rear upright bunk supports pivotally mounted to the framework, said rear upright bunk supports being connected to the rear ends of the respective bunk means;

and means operatively connected between the rear upright bunk supports and the framework for selectively pivotally moving the rear upright bunk supports relative to the framework for varying the transverse spacing between the rear ends of the bunk means between boat carrying positions wherein the bunk means are substantially parallel to one another for flecible engagement against the hull of a boat while in a loaded condition on the trailer and boat loading or unloading positions wherein the bunk means converge forwardly from laterally spaced rear ends in substantially horizontal positions to clear the boat hull.

4,011,959

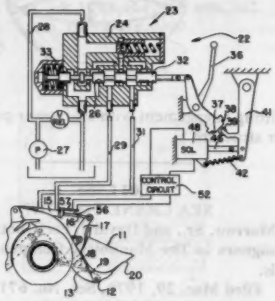
BUCKET-POSITIONER CIRCUIT WITH "NO DETENT" OPERATION

Stamos I. Papasideris, Bristol, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 13, 1976, Ser. No. 657,982

Int. Cl.² E02F 5/14

U.S. Cl. 214—762 **8 Claims**



1. A bucket-positioner for a loader vehicle having a bucket pivotably supported on a lift frame and a hydraulic tilt jack having telescoping cylinder and rod members for pivoting said bucket to and between rack-back and dump positions upon telescoping movement of said tilt jack members, a hydraulic valve operatively associated with said tilt jack, said valve having first and second positions for causing said tilt jack to move said bucket towards said rack-back and dump positions, respectively, and a third position for holding said tilt jack against operation, means biasing said valve to its third position, detent means for holding said valve in its first or second position, when moved thereto, and means including an electrically energizable solenoid for disabling said detent means when said solenoid is in one of its states of energization or de-energization the improvement comprising:

a. a magnet mounted on one of said tilt jack members,

b. a pair of proximity switches mounted on the other of said tilt jack members for sequential actuation by said magnet upon telescoping movement of said tilt jack members in either direction, at least one of said switches having normally open switch contacts,

c. a relay having a relay coil and contacts actuated by said relay coil when energized,

d. a source of electrical energy,

e. circuit means for connecting said relay coil to said source for energization of said relay upon actuation of said one proximity switch by said magnet,

f. holding circuit means for maintaining the connection of said relay coil, when energized, to said source through normally open contacts of said relay,

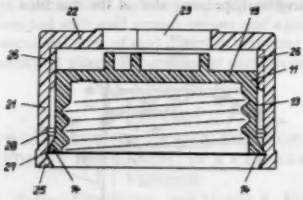
g. circuit means for connecting said solenoid to said source in response to said relay being in one of its states of energization of de-energization,

h. means actuable in response to a proximate position of said magnet to the other of said switches for breaking said holding circuit means.

4,011,960
SECURITY SCREW CAP

Yves Mauvernay, Riom, France, and Franz Zberg, Fribourg, Switzerland, assignors to S.A.S. Trading S.A., Switzerland

Filed Apr. 30, 1976, Ser. No. 682,097
Claims priority, application Switzerland, July 11, 1975, 9130/75
Int. Cl.² B65D 55/02, 85/56; A61J 1/00
U.S. Cl. 215—220 9 Claims



1. A security screw cap for receptacles for preventing access to dangerous products that may be contained therein by children but which may be used by adults as a normal screw cap, comprising:

a first internally threaded sleeve having an upper part closed by a disc including on it upper surface a contour in relief, and having on a lower part of its outer wall a plurality of regularly spaced abutments; and

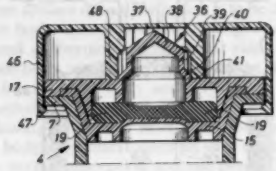
a second, external sleeve having an upper disc including means defining a complementary recess to said contour in relief of the first sleeve, and the inner surface of the wall of which has (a) at its lower part a continuous rim cooperating with said abutments of the first sleeve to hold it clipped in the second sleeve, (b) at its upper part a plurality of guide ribs allowing free rotation of the second sleeve on the first sleeve and (c), between said ribs and said rim, two continuous circular grooves for selectively receiving said abutments, said grooves being separated by a distance such that when said abutments are engaged in the groove nearest said rim said contour in relief is located below the plane of the disc of the second sleeve to provide a security position allowing free rotation of the second sleeve in both directions and when said abutments are brought into the groove furthest away from said rim by a pressure on the second sleeve after previously positioning it to bring said contour in relief to face said complementary recess the second sleeve is fixed to the first sleeve by engagement of said contour in relief in said complementary recess, the two sleeves being able to remain in this position to allow a normal use of the screw cap, or to be returned into said security position, after screwing the first sleeve onto a receptacle, by simply pulling on the second sleeve.

4,011,961
PLASTIC CONTAINER AND BREAKABLE SEALING UNIT ULTRASONICALLY WELDED THERETO

Paul Oskar Birger Widen; Kurt Arne Emil Jansson, and Anders Tore Kers, all of Uppsala, Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden

Filed Sept. 3, 1975, Ser. No. 609,959
Claims priority, application Sweden, Sept. 6, 1974, 7411316
Int. Cl.² B65D 41/50
U.S. Cl. 215—232 7 Claims

6. In combination: a container of plastic material having a throat; and a sealing unit comprising a sealing member provided with an outer flange bearing on, and ultrasonically welded to, said throat to seal the interior of said container, said flange extending inwardly from the periphery of said member, said member further including an upwardly projecting pointed portion in the central region of said flange and a connecting portion connecting said upwardly projecting portion to said flange, said connecting portion having a low resistance to breakage for permitting said upwardly projecting

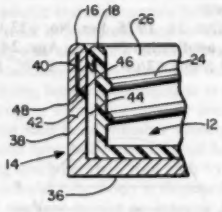


portion to be broken off from said flange to provide an opening in said sealing member.

4,011,962
TWO PIECE CLOSURE FOR CONTAINERS

Donald George Favell, Hamden, Conn., assignor to VCA Corporation, Baton Rouge, La.

Filed June 1, 1976, Ser. No. 691,243
Int. Cl.² B65D 41/04
U.S. Cl. 215—334 10 Claims



1. A two-piece closure for containers comprising:

a. a metal outer cap having a top wall integrally formed with an annular downwardly depending side wall, said side wall having a smooth, rounded edge formed by a U-shaped fold of a thin portion of said side wall which portion is of such a thickness that said fold has a thickness approximately equal to the thickness of that portion of said side wall adjacent to said thin portion; and,

b. an inner cap fixed within said outer cap, said inner cap having a top wall integrally formed with an annular downwardly depending side wall, and an attaching means for attaching said closure to said container.

4,011,963
CRYOGENIC VESSEL

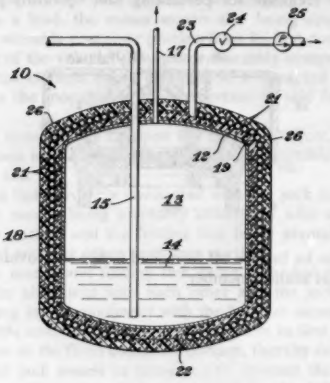
Chin Huan Cheng, and Burton D. Brubaker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 370,242, June 15, 1973, abandoned.
This application Dec. 27, 1974, Ser. No. 537,057
Int. Cl.² B65D 25/18
U.S. Cl. 220—9 LG 10 Claims

1. An improved cryogenic vessel, the cryogenic vessel defining a liquid-receiving cavity and an insulating layer, the insulating layer being of a material of generally low thermal conductivity, the improvement which comprises incorporating within the insulating layer

a layer of thermally insulating tubing, the tubing containing

a gas under a pressure not greater than one millimeter of mercury absolute to thereby provide improved thermal insulation of the vessel.

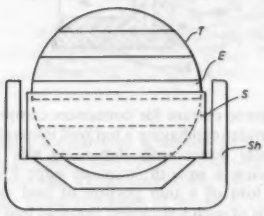


4,011,964

EQUATORIAL PROFILE FOR LARGE SPHERICAL TANKS

Arne Tonnessen, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Norway

Filed Oct. 16, 1975, Ser. No. 623,029
Claims priority, application Norway, Apr. 24, 1975, 751471
Int. Cl.² B65D *87/08, 87/32;* **F17C** *13/08*
U.S. Cl. 220—69 **4 Claims**



1. In an equatorial profile operable to constitute a part of the shell of a large spherical tank which part of the shell presents an exterior encircling projection cooperable with supporting means for the spherical tank, and wherein the projection and remainder of the equitorial profile are arranged to define therebetween a groove with a rounded bottom, the improvement comprising

means adjacent the area of said groove bottom for deflecting the neutral axis of said projection toward the neutral axis of the remainder of the equatorial profile on the other side of the groove, and

means adjacent the area of said groove bottom for deflecting the neutral axis of said remainder of the profile on the other side of the groove toward the neutral axis of said projection.

4,011,965

ENVELOPE-VENDING MACHINE

Robert E. Fitzgerald, P.O. Box 100, Barrington, Ill. 60010

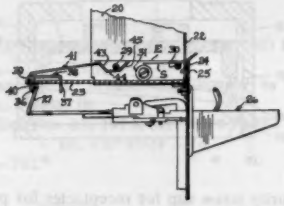
Filed Jan. 21, 1976, Ser. No. 650,888
Int. Cl.² B65H *3/36*
U.S. Cl. 221—40 **2 Claims**

1. In an envelope-vending machine having a coin-controlled manually operated activating mechanism that effects vending of an envelope through a dispensing slot provided by the machine, wherein the improvement provides

a. a vertical envelope supply compartment having a bottom wall juxtapositioned with respect to the dispensing slot of the machine,

b. a pair of envelope-supporting rods extending in spaced parallel relation above said bottom wall of said compartment and the dispensing slot of the machine,

c. a dispensing member reciprocally movable through said compartment over said bottom wall through a plane normal to the dispensing slot of the machine,



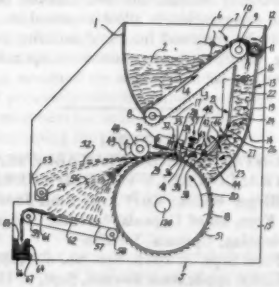
d. a spring-biased envelope-engaging plate connected to and movable linearly through said compartment with said dispensing member and into contact with said one of said rods and yieldably movable thereby through a substantially vertical component into contact with and beneath the sealing flap of the lowermost envelope of the supply of envelopes within said compartment, with said envelope-engaging plate adapted to push the sealing flap of the envelope out of the dispensing slot of the machine upon complete reciprocal movement of said dispensing member over said bottom wall of said envelope supply compartment.

4,011,966

DISTRIBUTOR FOR CIGARETTE ROD MAKING MACHINES OR THE LIKE

Günter Wahle, Reinbek, and Jürgen Gomann, Dassendorf, both of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Mar. 2, 1976, Ser. No. 663,119
Claims priority, application Germany, Mar. 6, 1975, 2509720
Int. Cl.² B67D *5/14*
U.S. Cl. 222—55 **10 Claims**



1. In an apparatus for producing and processing a homogenized layer of fibrous particles, particularly in a distributor for shredded tobacco, a combination comprising a source of fibrous particles, said source having an outlet and said outlet having a variable cross-sectional area; a conveyor having means for removing from said outlet a continuous layer of fibrous particles and for advancing said layer in a predetermined direction along a predetermined path wherein said

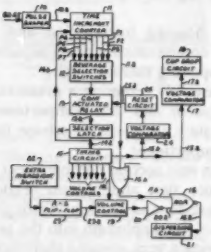
layer has an exposed side; a barrier adjacent to said path and having a first surface in contact with the exposed side of said layer and a second surface adjacent to said first surface, extending substantially transversely of said path and facing counter to said direction so that at least some fibrous particles of said layer are intercepted by and pile up at said second surface; means for moving said barrier substantially transversely of said path whereby said first surface homogenizes that portion of said layer which is moved beyond said second surface; sensor means for monitoring the quantity of piled-up particles at said second surface; and adjusting means operatively connected with said sensor means and arranged to vary the cross-sectional area of said outlet in response to variations in the quantity of piled-up particles at said second surface.

4,011,967

ELECTRONIC SYSTEM DEVICE FOR CONTROL OF INGREDIENT DISPENSING IN A CUP BEVERAGE VENDOR

Richard J. Halsey, Grandview, and Melvin R. Heillman, Kansas City, both of Mo., assignors to The Vendo Company, Kansas City, Mo.

Filed July 21, 1975, Ser. No. 597,429
Int. Cl.² G01F *11/00*
U.S. Cl. 222—70 **9 Claims**



1. An apparatus having mechanisms for dispensing ingredients capable of producing a beverage of cup proportion, said apparatus comprising:

means for selecting a beverage to be dispensed by said apparatus;

a source of said ingredients constituting said beverage;

electronic means for producing a time base; said time base producing means including a timing circuit means for producing an output voltage that varies lineraly with respect to time, and means for initiating the production of said output voltage in accordance with the occurrence of preselected events including the selection of a beverage by said selection means;

means for correlating said electronically produced time base with a quantity of ingredients; and

means for causing said correlated quantity of said ingredients to be dispensed from said ingredients source by said mechanisms thereby producing a cup portion of said beverage.

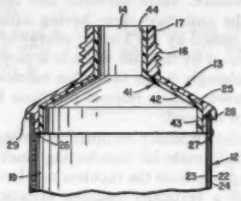
4,011,968

COLLAPSIBLE CONTAINERS

Russell Park McGhie, Somers, N.Y., and Joseph George Ferraro, Wyckoff, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 393,307, Aug. 31, 1973, abandoned, which is a continuation of Ser. No. 200,922, Nov. 22, 1971, abandoned. This application Apr. 25, 1975, Ser. No. 571,511
Int. Cl.² B65D *35/12*
U.S. Cl. 222—107 **1 Claim**

1. A collapsible container comprising a tubular body made from a single blank of flexible sheet material having its opposite side edges overlapped to provide a longitudinal seam, said blank comprising a sheet of metal foil extending over substantially the full area of the blank and having non-metallic thermoplastic material surface bonded at least along side edge areas of one surface of said foil which is to be the inner surface of the tube body in such locations as to provide a heat sealed narrow band of thermoplastic material along and within said longitudinal body seam upon overlap of the side edges of the blank to form a tube body and an integral one-piece preformed non-metallic solid head member of thermoplastic material having an annular skirt telescoped within an end of said tube body, and insert element of a material that is less subject to oxygen absorption and less permeable to the product in the tube body than the material of said head member



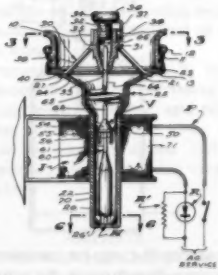
tightly frictionally disposed within said head member for isolating coextensive surfaces of said head member with respect to the product in the container, said metal foil having a further area of thermoplastic material surface bonded thereon on said one surface at least in a narrow band at the tube body upper end surrounding said skirt, said areas of thermoplastic material being substantially continuous, and said tube body and head member being heat sealed together at said annular band in an annular region extending entirely around said skirt, an external skirt on said head member closely surrounding the outer side of said tube body around said heat sealed region, said skirts being spaced at their root ends by an annular shoulder against which the tube body is disposed in end abutment and said insert element having an external lip underlying the lower edge of said annular skirt.

4,011,969

MATERIAL DISPENSER

Ernest Newell Martin, 1027 E. 5th St., Escondido, Calif. 92025

Filed May 19, 1976, Ser. No. 688,007
Int. Cl.² B65G *3/12, 27/24*
U.S. Cl. 222—196 **16 Claims**



1. A material dispenser comprising a material receiver, an elongate vertical material conducting duct communicating with and depending from the receiver and having a lower open discharge end, a vertically opening orifice smaller in diameter than the duct and positioned in the duct above the lower end thereof, an elongate valving member normally engaged in the orifice in a normal closed position and shiftable vertically

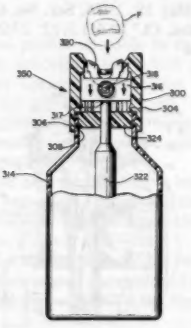
relative thereto to an open actuated position, an elongate vertically armature in the duct below the orifice and valve member and freely shiftable vertically in the duct from a lower normal position to an upper actuated position therein, means drivingly connecting the armature and the valve member, an annular coil about the duct and positioned so its field intersects the upper portion of and extends above the armature when said armature in its normal position is drivingly elevated in the duct and the valve member is moved from its normal to its actuated position when the coil is energized, a power supply with on and off switch means connected with and selectively operable to cyclically energize the coil, an elongate vertical stem with an upwardly disposed striker end projecting upwardly from the valve member, an anvil normally spaced above the stem and engaged by the striker end of the stem when the armature, valve member and stem are drivingly elevated by the coil, said stem having axially compressible spring means biased by the kinetic energy of the mass of the structure elevated by the coil when it is stopped by the anvil and which yieldingly urges the valve member and armature downwardly toward their normal positions between cyclical energization of the coil.

12. A material dispenser comprising a material receiver, an elongate vertical material conducting duct communicating with and depending from the receiver and having a lower open discharge end, a vertically opening metering orifice in the duct, a valving member normally engaged in the orifice in a normal closed position and shiftable vertically to an open position, an armature freely engaged in the duct and shiftable upwardly therein from a lower normal position, means drivingly connecting the armature and the valve member, an annular coil about the duct and positioned so its field normally intersects the armature whereby the armature is drivingly elevated and the valve member is moved to its open position when the coil is energized, a power supply connected with and operable to cyclically energize the coil and including a half-wave rectifier in series with the coil and a resistor in parallel with the rectifier, whereby the coil is energized by pulsating direct current and supplemental alternating current.

4,011,970
SAFETY ACTUATOR CAP

William G. Crowle, Deerfield, and Efrem M. Ostrowsky, Highland Park, both of Ill., assignors to VCA Corporation, Baton Rouge, La.

Filed May 20, 1976, Ser. No. 688,229
Int. Cl.² B65D *83/14*
U.S. Cl. 222—321 **13 Claims**



1. A safety overcap for use on containers which have a dispensing stem extending through the top of the container, which overcap comprises:

a. actuator means attached to the stem;

b. an outer shell enclosing said actuator and attached to said container by attaching means, said outer shell having

i. a dispensing window via which said product leaves the enclosed area of said outer shell and

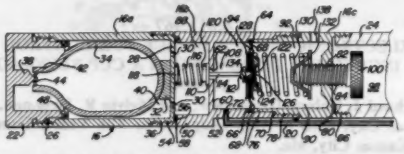
ii. a pair of spaced apart apertures positioned in the proximity of said actuator; and

c. a U-shaped communicator having its bottom portion slidably contacting said actuator and having the upper portion of its legs extending through said apertures.

4,011,971
DEVICE FOR DISPENSING LIQUIDS FROM A SEALED CONTAINER AND FOR PRESERVING UNDISPENSED PORTIONS THEREOF

Edward R. Haydon, Steamboat Springs, Colo., assignor to Edward R. Haydon, Steamboat Springs, Colo.

Filed Dec. 29, 1975, Ser. No. 644,933
Int. Cl.² B65D *83/14*
U.S. Cl. 222—399 **1 Claim**



1. A device for preserving perishable liquids in a container sealed by a cork-type closure and for providing means for selectively removing the liquids from the container comprising:

an elongated housing having first and second compartments, said compartments being separated by a partition having an opening therethrough,

means for releasably retaining a pressurized canister of an innoxious gas in said first compartment and means for puncturing such a canister to release the gas therein into the first compartment,

a diaphragm in said second compartment dividing the compartment into first and second sections, and resilient means in said second section yieldingly resisting flexing movement of the diaphragm into the second section, said housing having a vent opening therethrough in communication with said second section such that said second section is pressurized at the ambient atmospheric pressure,

closure means operatively connected to said diaphragm for selective movement therewith, said closure means normally operative to close said opening in the partition between compartments but movable with selected movement of the diaphragm to open said opening,

first conduit means in fluid communication with said first section and having means adapted to enable the conduit to penetrate the cork-type closure of the container to establish fluid communication between the first section and the interior of said bottle such that innoxious gas can be selectively transferred from the housing to the container,

second conduit means connected to said housing and also having means adapted to enable the second conduit to penetrate the cork-type closure of the container, said second conduit providing means for removing liquid from the container, and

valve means in said second conduit means to control the flow of liquid therethrough.

4,011,972
CONTINUOUS FLOW CENTRIFUGE APPARATUS

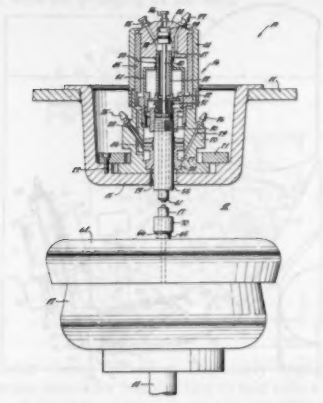
Victor V. Pederson, Los Altos, and Herschel E. Wright, Santa Clara, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 28, 1975, Ser. No. 626,551
Int. Cl.² B04B *15/00*
U.S. Cl. 233—1 A **4 Claims**

1. In a continuous flow centrifuge apparatus including a housing defining a vacuum chamber, a rotor positioned in said

vacuum chamber, a first rotary transfer tube and a second rotary transfer tube connected to said rotor for conducting a sample to and from said rotor, said second rotary transfer tube being coaxially aligned within said first rotary transfer tube, a stationary inlet/outlet assembly connected to said housing for conducting said sample to and from said first and second rotary transfer tubes, and a bushing surrounding said first transfer tube for creating an oil film to provide a vacuum seal around said first transfer tube, the improvement comprising:

an elongate, cylindrical sleeve surrounding, spaced from, and coaxial with said first transfer tube, adjacent the



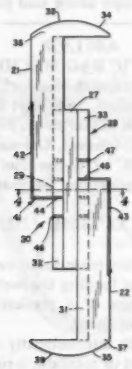
upper end thereof, positioned between said first transfer tube and said bushing to form a vacuum annulus between said first transfer tube and said sleeve, the upper end of said sleeve including a stem connected to said upper end of said first transfer tube, said oil film around said first transfer tube being created between said bushing and the outer surface of said sleeve whereby the vacuum annulus formed between the inner surface of said sleeve and the outer surface of said first transfer tube minimizes heat transfer between said oil film and said sample conducted through said first and second transfer tubes.

4,011,973

CAP SHAPE PRESERVING DEVICE

James A. Leach, Box 449 Main St., Ashby, Mass. 01431

Filed Mar. 26, 1976, Ser. No. 670,901
Int. Cl.² D06C *15/00*
U.S. Cl. 223—84 **10 Claims**



1. A cap shape-preserving device adapted to fit compactly in the pocket of the user, said device comprising:

at least two elongated members of rigid material, and of predetermined length, normally overlapping each other in compacted, pocket carrying position;

rib and undercut groove means holding said members together laterally to slide longitudinally upon each other; from said compacted position to expanded cap shape preserving position;

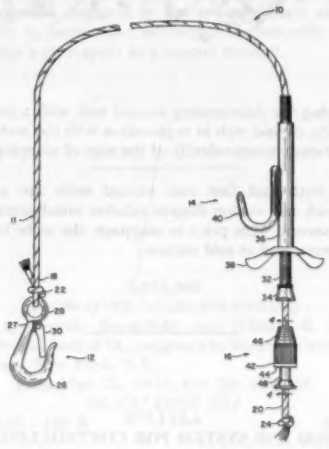
and latching mechanism normally locking said members in said compacted position against relative sliding movement and adapted to lock said members in selected positions of expansion.

4,011,974

VEHICLE CARGO STRAP

Dominick Frank Scarola, 242 W. Mount Pleasant Ave., Livingston, N.J. 07039

Filed June 6, 1975, Ser. No. 584,255
Int. Cl.² B60R *9/04*, *11/00*; **B61D** *45/00*; **F16G** *11/10*
U.S. Cl. 224—42.1 B **7 Claims**



1. Vehicle cargo strap for securing a load to a vehicle comprising:

an elongate flexible connecting member with a first and second end;

a fastening means attached proximal to said first end of said connecting member for fastening said first end to the vehicle;

a hook means secured to a sleeve, said sleeve slidably, coaxially mounted on said connecting member, said hook means for fastening said second end of said connecting member to a vehicle; and

a positioning means, slidably, coaxially mounted on said connecting member between said sleeve and the second end of said connecting member, said positioning means for positioning said hook means along said connecting member, said positioning means including pinching means for securing said positioning means to said connecting member.

4,011,975

WEB HANDLING SYSTEM

Fred P. Brown, Jr., Centerville, Mass., assignor to Packaging Industries, Inc., Hyannis, Mass.

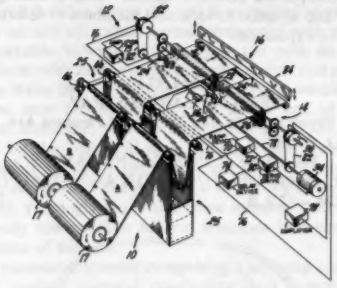
Filed Sept. 8, 1975, Ser. No. 611,234
Int. Cl.² B65H *25/24*
U.S. Cl. 226—2 **12 Claims**

9. A method of web handling including the steps of

a. moving a first web along a predetermined path of travel,

b. moving a second web along a predetermined path of travel,

c. detecting the approach to a web processing station of a preselected web portion of the first web,
d. decelerating both of the first and second webs upon said step of detecting the approach of only the preselected web portion of the first web,
e. stopping the decelerating first web with said preselected portion in registration with the web processing station,



f. stopping the decelerating second web with a preselected portion of said web in registration with the web processing station independently of the step of stopping the first web,

whereby both said first and second webs are accurately aligned with said station despite relative misalignment of the first and second webs prior to stoppage, the webs to simultaneously processed at said station.

4,011,976

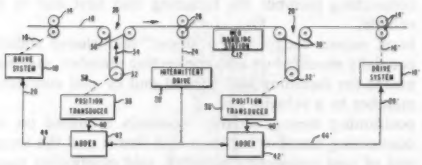
METHOD AND SYSTEM FOR CONTROLLING WEB SPEED

Thomas Marion Greer, Brevard, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 15, 1975, Ser. No. 622,675

Int. Cl.² B65H *25/04*

U.S. Cl. 226—8 **10 Claims**



1. A method of controlling the speed of a web in a web transport, having a dancer roll and both continuous and intermittent drives, utilizing the average position of the dancer roll comprising the steps of:

generating a first signal having unidirectional and bidirectional components corresponding to the instantaneous position of said dancer roll,

generating a second signal having a bidirectional component related to the web movement produced by said intermittent drive,

algebraically combining said first and second signals to produce a resultant signal indicative of the average position of said dancer roll, and

controlling said continuous drive with said resultant signal, thereby to maintain the speed of said web relatively constant.

4,011,977

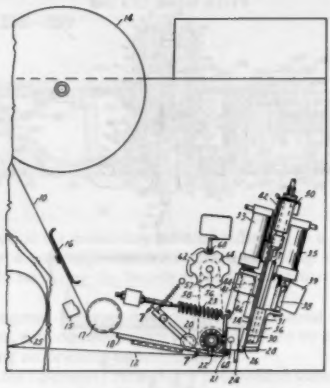
TAPE HANDLING APPARATUS

Larry A. Bettenhausen, West Lakeland Township, Washington County; James H. Casey, Roseville, both of Minn., and Robert A. Luhman, Cylon Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 436,874, Jan. 28, 1974, Pat. No. 3,929,552. This application Sept. 25, 1975, Ser. No. 616,641

Int. Cl.² B65H *23/34*

U.S. Cl. 226—88 **2 Claims**



1. In a machine for handling a length of tape comprising a backing, a pressure-sensitive adhesive coating on one surface of said backing, a lofty fibrous surface on said backing opposite said adhesive coated surface, and a release liner applied to said adhesive coated surface, said liner having a width greater than that of said backing and extending outward from each side of said backing along the length thereof, the combination of

a platen for supporting said tape, said platen having a width not exceeding that of said backing,

a guide roller engageable with said fibrous surface to hold said tape on the platen, said roller having radially extending end flanges positioned along the edges of the platen to engage and bend the outward extending edges of said liner along the edges of said platen to guide said tape along said platen, and

a driven roller having a toothed outer peripheral surface positioned above the platen with the toothed surface engageable with said fibrous surface of said tape to frictionally move said tape along said platen.

4,011,978

PLASTIC BAG MACHINE

Hans Lehmacher, Niederkassel-Mondorf; Heinz-Eugen Klüppel, Niederkassel-Lulsdorf, and Karl Dreckmann, Hennef-Sieg-Altenbodingen, all of Germany, assignors to Hans Lehmacher, Niederkassel-Mondorf, Germany

Filed July 24, 1975, Ser. No. 598,775

Claims priority, application Germany, Aug. 2, 1974, 2437325

Int. Cl.² B65H *17/22*

U.S. Cl. 226—142 **16 Claims**

1. In a machine handling material to be processed at a work station in web form, and feeding the web to the work station intermittently by sections of a predetermined length, web feeding mechanism comprising:

a pair of web feed rolls intermittently rotationally driven to feed, in each period of rotation, a respective web section length;

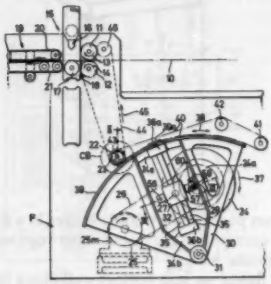
a continuously rotationally driven crank disk bearing a crank pin;

means adjustably securing the crank pin on the disk at a selected radial distance from the disk rotational axis;

a lever arm pivotally mounted with pivot axis parallel to and eccentric to said disk axis, to oscillate over the disk;

a slide block supported on the lever arm to slide radially relative to the arm pivot axis, and having the crank pin pivotally engaged therein, whereby the arm is swung between two extreme positions with a longer time interval for the swing in one direction and a shorter time interval for the opposite swing in the other direction;

means for converting the oscillating motion of the said arm into derived rotational motion reversing in rotational sense with the swinging of the arm;



transmission means including alternately engaged clutch and brake means for transmitting to said rolls a rotational motion derived from the arm during one of said intervals by clutch engagement, and interrupting motion transmission to the rolls for the other interval by clutch disengagement with brake engagement;

said clutch and brake means comprising an electromagnetically actuated clutch,

an electromagnetically actuated brake, and

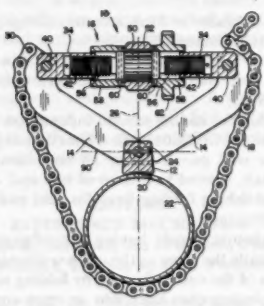
switch means supported on said slide block, and actuated upon the arm reaching the extreme positions of its oscillation for controlling the alternating engagement of the said clutch and brake.

4,011,979

PORTABLE WELDING JIG

Paul Hagen, Thunder Bay, and Lucien Delisle, St. Foy, both of Canada, assignors to Pelco Tools Limited, Markham, Canada

Filed Sept. 2, 1975, Ser. No. 609,378
Int. Cl.² B23K *37/04*
U.S. Cl. 228—49 **7 Claims**



1. A portable welding jig comprising

a. pressure plate means shaped to engage a minor peripheral portion of the circumference of a conduit,

b. a pair of lever arm members each having an inner end and an outer end, the inner ends of the lever arms being pivotably mounted on said pressure plate and the outer ends of said lever arms being spaced from one another above said pressure plate,

c. flexible conduit embracing means having opposite ends connected to each outer end of said lever arms, said flexible conduit embracing means extending from said arms below said pressure plate and being adapted to embrace a conduit and extend tangentially upwardly therefrom to said outer ends of the lever arms,

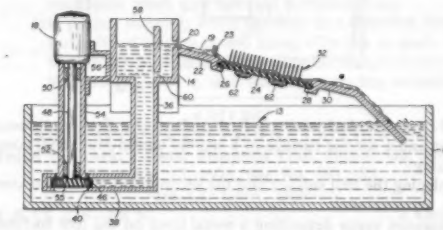
d. drive means disposed above said pressure plate and connected to said outer ends of said lever arms, said drive means being operative to move said outer ends of said lever arms towards and away from one another by movement of said arms in an arc about their pivotal connection with said pressure plate, the movement of said lever arms towards one another causing the flexible conduit embracing means to tighten against a conduit and driving the pressure plate radially inwardly to deflect the portion of the conduit engaged by the pressure plate radially inwardly to permit spot welding of the inwardly deflected portion with respect to a second conduit.

4,011,980

FLOW-OVER MASS SOLDERING

Howard A. Dvorak, Brookfield, and William R. Studnick, Bolingbrook, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,466
Int. Cl.² H05K *3/34*
U.S. Cl. 228—180 R **10 Claims**



1. The method of connecting lands on opposite sides of a printed wiring board to electrical terminals which have been inserted through apertures in the lands, and the board, which comprises:

supporting the printed circuit board in a position at an inclination to the horizontal;

flowing molten solder from an upper edge of the printed circuit board over an upwardly-facing surface of the board so that portions of the molten solder flow by gravity into the apertures and onto the lands on the underside of the board;

interrupting the flow of molten solder over the upwardly facing surface of the printed circuit board after a predetermined time period sufficient to flow the solder onto the lands on the underside of the board; and

permitting the molten solder in the holes in the printed circuit board to solidify to connect the lands of the board to the terminals in the holes.

4,011,981
PROCESS FOR BONDING TITANIUM, TANTALUM, AND ALLOYS THEREOF

Peter A. Danna, Milford, Conn.; Richard A. Holcomb, Lake Charles, La., and Richard J. Roethlein, Stafford Springs, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 27, 1975, Ser. No. 562,729
Int. Cl.² B23K *1/20*
U.S. Cl. 228—208 23 Claims

1. A process for bonding a first film-forming metal selected from the group consisting of titanium, tantalum, zirconium, niobium, tungsten and alloys thereof to a second metal which comprises:

a. applying a first coating of a platinum metal component selected from the group consisting of platinum group metals, platinum group metal compounds, and mixtures thereof to said first film-forming metal,

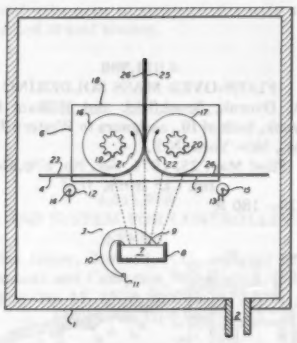
b. applying a second coating of copper to said first coating, and

c. soldering said second metal to said second coating of copper on said first film-forming metal.

4,011,982
SURFACE JOINING BY BONDING OF METAL AND DEPOSITED METAL

William G. Marancik, Basking Ridge, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Sept. 15, 1975, Ser. No. 613,645
Int. Cl.² B23K *19/00*
U.S. Cl. 228—208 14 Claims



1. A method of joining a first surface of a first continuous strip and a second surface of a second continuous strip, comprising:

placing the first surface and the second surface in a vacuum environment;

vacuum vapor depositing a metal layer on the first surface;

preparing the second surface in vacuum to expose fresh metal;

continuously placing the deposited metal and the exposed metal in contact in vacuum; and, still in vacuum,

applying pressure to the contacted metal sufficient to join the surfaces.

4,011,983
BAG CONTAINER

William Henry Greene, 1637 Van Buren Ave., St. Paul, Minn. 55104

Filed Feb. 24, 1976, Ser. No. 660,798
Int. Cl.² B65D *5/60*
U.S. Cl. 229—14 BE 1 Claim

1. In combination:

a rectangular container for a grocery bag or the like including:

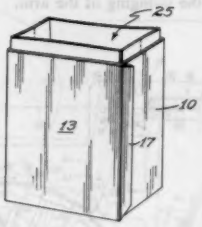
rectangularly extending vertical walls foldable from a flat form to a rectangular form,

a bottom panel hingedly secured to the lower edge of one of said walls and foldable to form a bottom for said container on which said grocery bag may rest,

a grocery bag having a flat bottom resting upon said bottom panel and shaped to fit within rectangularly arranged vertical walls,

a first flange connecting said bottom panel to the lower edge of said one of said walls,

a crease intermediate the edge of said first flange connected to said bottom wall and the edge thereof connected to said bottom panel whereby said flange may flex,



said bottom panel being slightly longer in a direction normal to said crease than the distance between said one wall and the opposite wall,

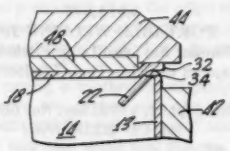
a second flange on said bottom wall along the edge thereof connected to said flange and lying inwardly of said opposite wall, said second flange extending downwardly inwardly of said opposite wall to terminate adjacent the lower edge of said opposite wall, whereby

the downward folding of said bottom panel will cause said first flange to fold along said crease.

4,011,984
CARTON BLANK, CARTON AND METHOD OF FORMING CARTON

Mitchel J. Matovich, Jr., Los Gatos, Calif., assignor to Nolex Corporation, Los Angeles, Calif.

Filed Nov. 3, 1975, Ser. No. 628,444
Int. Cl.² B65D *5/06*
U.S. Cl. 229—37 R 9 Claims



1. A blank foldable to form a carton comprised of:

a body of sheet material;

said body having a plurality of parallel first indentation lines defining side wall panels of the carton and establishing folding lines;

said body further having second indentation lines generally normal to the first indentation lines defining at the ends of said side wall panels either an end closure panel or a sealing tab, limited to a total of two end closure panels, and establishing folding lines for said end closure panel and sealing tabs;

said end closure panels having a configuration and area substantially the same as the cross-sectional configuration and area of the carton formed by folding said blank along the first indentation lines into an open-ended tube;

said end closure panels being marginally embossed along their free edges to impart to said end closure panels curving and sloping surfaces spaced inwardly from the free edges of those panels;

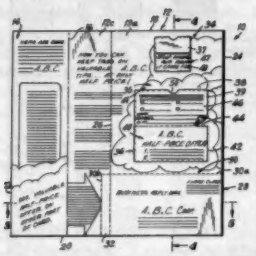
each of said end closure panels being depressible to bring its curving and sloping surfaces into surface contact with the folded sealing tabs at its end of the tube to bend said sealing tabs obliquely downwardly at an angle of greater than 90° with respect to the plane of said side wall panels to close that end of the carton.

4,011,985

COMBINED ADVERTISING INSERT AND MAILING ENVELOPE

Walter A. Simson, 230 Beverly Road, Scarsdale, N.Y. 10583

Filed Aug. 21, 1975, Ser. No. 606,362
Int. Cl.² B65D 27/00; G09F 1/04
U.S. Cl. 229—68 R **12 Claims**



1. An insert for a magazine of the saddle stitch type, comprising a flap; a generally rectangular advertising page connected to said flap along a first fold line which fold line is generally coextensive with the crease lines of the pages of the magazine to position said flap and said advertising page on opposite sides of the saddle of the magazine when the insert is placed into the same, said advertising page comprising first and second overlapping panels connected to each other at a second fold line substantially parallel to said first fold line, said first panel being wider than said second panel to form a double thickness page portion and a single thickness page portion which is between said flap and said double thickness portion; tear line means extending from said second fold line to a point beyond said double thickness portion to delineate one side of an envelope pocket on said double thickness portion and a closure tab on said single thickness portion, said tear line means generally separating said double thickness portion into an envelope panel portion and a window panel portion; a plurality of window means in one of said panels of said window panel portion for permitting the lifting of a portion of one of said panels to expose information in registry with the resulting opening on the other of said panels, said window means generally being spaced from each other along a predetermined direction; and adhesive means joining said first and second panels to each other at selected portions thereof, said adhesive means including adhesive strips provided along the edges of said window panel portion along and on both sides of a portion of said tear line means, along said envelope pocket, and along said closure tab, adhesive strips being provided and oriented generally normally to said predetermined direction between adjacent window means, whereby said first and second panels are connected to each other substantially about the peripheries of each of said window means.

4,011,986

INTERPOSER MECHANISM

Richard C. O'Brien, deceased, late of Dayton, Ohio (by Elva R. O'Brien, executrix), assignor to O.K. Partnership, Cincinnati, Ohio

Filed Apr. 14, 1976, Ser. No. 676,758
Int. Cl.³ G06K 1/05
U.S. Cl. 234—47 **20 Claims**

15. In a coder for selectively notching articles having a sorting edge to encode the articles, said coder comprising:

article support means for supporting an article to be encoded;

a plurality of knife blades, each of said knife blades being movable transversely of said article to form a notch in said article;

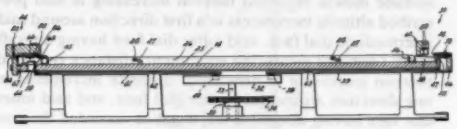
a plurality of actuating members, one of said members being interconnected to each knife blade, said actuating members being slidably disposed in a plurality of parallel slots;

each of said knife blades being shifted transversely of said slot in response to movement of its associated actuating member;

the improvement comprising an interposer mechanism for selectively displacing said actuating members and knives in accordance with a preselected code, said interposer mechanism comprising:

a solenoid disposed above each of said slots and spaced longitudinally from the ends of said actuating members;

an interposer blade disposed in each of said slots for slidable movement therein;



said interposer blade being disposed longitudinally beyond the actuating member in said slot and being effective, when moved in the direction of said actuaing member, to cause said member to be shifted longitudinally within said slot;

said interposer blade being positionable in an initial position beneath, and spaced from, said solenoid, whereby when said solenoid is energized, said interposer blade is elevated to a position in which a portion of said blade is disposed above said slot;

a pusher assembly being positionable in an initial position above the ends of said slots;

said pusher assembly including a magnet and associated pole member, said pole member being effective to engage any blade elevated in response to actuation of one of said solenoids, and being effective to capture said blade when said solenoid is deenergized;

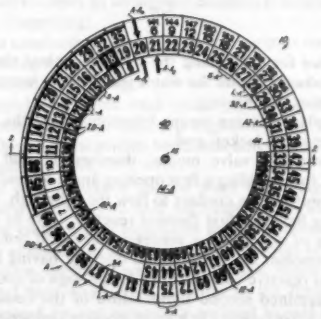
said pusher assembly being shiftable in a direction longitudinally of said slots and being effective to push the blades captured by said pole member longitudinally of said slots to thereby shift the corresponding members.

4,011,987

AIRCRAFT DESCENT PROFILE CALCULATOR

Frank L. Cheek, 1 Cedar Mountain Trail, Suches, Ga. 30572

Filed Jan. 22, 1976, Ser. No. 651,553
Int. Cl.² G06C 3/00
U.S. Cl. 235—88 N **5 Claims**



1. An aircraft descent calculator comprising:

a central member defining an outer annular dial face about the periphery thereof;

an intermediate member defining an intermediate annular dial face about the periphery thereof, said intermediate member rotatably mounted on said central member in juxtaposition with said central member so that said intermediate dial face lies adjacent the inside of said outer dial face and is rotatable with respect to said outer dial face about a common axis of rotation coinciding with the center of said outer dial face;

an inner member defining an inner annular dial face about the periphery thereof, said inner dial member rotatably mounted on said intermediate member in juxtaposition with said intermediate dial face about said common axis of rotation; and,

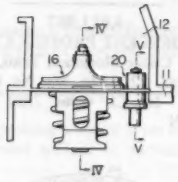
each of said dial faces divided into equal angular spaces so that said angular spaces on each of said dial faces is selectively alignable with the angular spaces on the adjacent dial face, said intermediate dial face having aircraft altitude indicia recorded thereon increasing in said prescribed altitude increments in a first direction around said intermediate dial face, said outer dial face having aircraft DME (distance measuring equipment) distance recorded thereon increasing in prescribed distance increments in one direction around said outer dial face, and said inner dial face having aircraft DME distance recorded thereon increasing in said prescribed distance increments in the direction around said inner dial opposite to said one direction around said outer dial face so that said dial face can be manipulated to deteremine positions on a prescribed aircraft descent profile.

4,011,988

DEVICE FOR CONTROLLING THE FLOW OF COOLING WATER IN AN INTERNAL COMBUSTION ENGINE

Masao Inagaki, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 16, 1975, Ser. No. 596,408
Claims priority, application Japan, July 22, 1974, 49-83293
Int. Cl.² F01P 7/02
U.S. Cl. 236—34.5 **5 Claims**



1. A device for controlling the flow of coolant circulating between the radiator and the water jacket in an internal combustion engine, comprising:

single coolant passage means interconnecting the radiator and the water jacket, and;

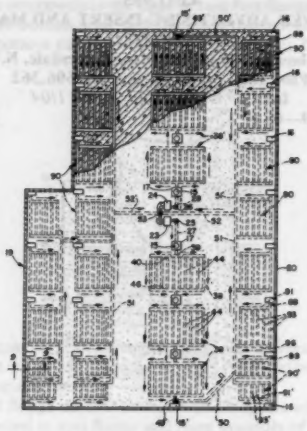
thermal reactive valve means, disposed in said passage means, for providing a first opening and a second opening for permitting the coolant to flow therethrough, said first opening having a first thermal reactive valve to open for passage of coolant at a predetermined first temperature of the coolant and said second opening having a second thermal reactive valve to open for passage of coolant at a predetermined second temperature of the coolant, said second valve opening at a lower coolant temperature than the first valve and the area of the first opening being larger than that of the second opening.

4,011,989

METAL BUILDING WITH INTEGRATED HOT WATER HEATING SYSTEM

Richard E. Diggs, 12A Road, Carthage, Mo. 64836

Filed Aug. 14, 1975, Ser. No. 604,663
Int. Cl.² F24D 3/00
U.S. Cl. 237—59 **34 Claims**



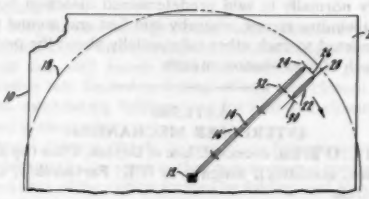
1. A building with an integrated heating system, comprising: a building having a floor and a frame including upright, tubular, fluid-conveying columns supported on the floor and sloping, tubular, fluid-conveying roof beams supported on and in fluid communication with the columns, the columns being hollow and fluid tight so that heat exchange fluid can be circulated throughout said building frame; a plurality of heating grid means in the floor, said heating grid means each including a plurality of pipes connected to receive fluid from the columns, selected one of said columns having valves therein for controlling flow of fluid therethrough so that heating grid means fluidly connected to said selected columns can be individually controlled; heater means connected to heat the fluid; and fluid circulating means connected to circulate the fluid through the heater means, the columns and roof beams and the heating grid means to heat the building to a substantially uniform temperature throughout.

4,011,990

CENTER PIVOT IRRIGATION SYSTEM

Charles H. Meis, Genoa; David A. Siekmeier, Columbus, and Arthur L. Zimmerer, Lindsay, all of Nebr., assignors to Lindsay Manufacturing Company, Lindsay, Nebr.

Filed Mar. 24, 1976, Ser. No. 669,918
Int. Cl.² B05B 3/12
U.S. Cl. 239—11 **32 Claims**



1. A method of operating a center pivot irrigation system to irrigate a field which has one or more noncircular areas, the system including a main irrigation pipe system with sprinkler units thereon supported at intervals on wheeled towers and

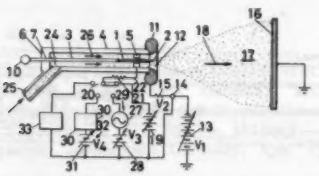
arranged to pivot about a center and a wheeled extension with sprinkler units thereon pivotal adjacent the end of the main pipe system, including the steps of simultaneously pivoting and sprinkling with the main pipe system through a generally circular part of the field to be irrigated and, at the same time, positioning the extension within the circular area and with its sprinkler units deenergized, stopping the main pipe system opposite a noncircular area to be irrigated outside of the circular area of the field and deenergizing its sprinkler units, pivoting the extension about the now stationary outer end of the main pipe system through an arc that extends outside of the circular area into the noncircular area and operating the sprinkler units on the extension so as to irrigate the noncircular area while holding the main pipe system stationary and its sprinkler units deenergized, pivoting the extension back to a position within the circular area and stopping its pivoting motion and deenergizing its sprinkling units, thereafter moving the main pipe system again and energizing its sprinkler units with the extension and its sprinkler units deenergized until the system is again opposite a noncircular area to be irrigated where the cycle is repeated.

4,011,991

ELECTROSTATIC POWDER PAINTING APPARATUS

Senichi Masuda, 40-10-605, 1-chome, Nishigahara, Kita-ku, Tokyo, Japan

Filed July 29, 1975, Ser. No. 599,994
Claims priority, application Japan, Aug. 4, 1974, 49-89351
Int. Cl.² B05B 5/02; B05C 5/00
U.S. Cl. 239—15 **16 Claims**



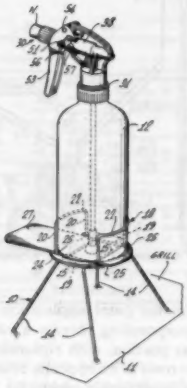
1. An electrostatic powder painting apparatus characterized in that said apparatus comprises a discharge electrode including a corona discharge portion having a small radius of curvature for producing corona discharge for charging powders, a driving electrode having a large radius of curvature which is disposed in the vicinity of said corona discharge portion and insulated from said discharge electrode, powder supply means for supplying paint powders to the vicinity of a corona discharge space formed between said corona discharge portion of said discharge electrode and said driving electrode, a driving D.C. high voltage source coupled between said driving electrode and a body to be painted for applying a D.C. high voltage between said body to be painted and said driving electrode to establish a driving electric field which drives the charged powders towards said body to be painted to be adhered thereto, and a charging variable high voltage source coupled between said discharge electrode and said driving electrode for applying a variable high voltage between said discharge electrode and said driving electrode to produce a variable corona discharge current consisting of a flow of ions of the same polarity as said driving electrode relative to said body from said corona discharge portion of said discharge electrode to said driving electric field, whereby said powders may be charged, driven and electrostatically adhered onto said body to be painted while controlling the magnitude of said corona current independently of said driving electric field in a manner to accommodate the nature of the paint powders employed.

4,011,992

SYSTEM FOR HEAT CONDITIONING OF NON-STICK LIQUID PREPARATION FOR SPRAYING ON GRILL

Russell D. Olsen, Culver City, Calif., assignor to Par-Way Mfg. Co., Los Angeles, Calif.

Filed July 23, 1975, Ser. No. 598,344
Int. Cl.² B05B 1/24; B67D 5/62
U.S. Cl. 239—135 **6 Claims**



1. A warming device for use with a cooking surface adapted to be maintained at a standardized cooking temperature of the order of approximately 350°–400° F., for spraying a normally viscous, liquid, vegetable and lethecin non-stick substance from a container vessel onto such cooking surface, said container vessel having a mouth at the top, and a spray attachment joined to the latter, said spray attachment having a liquid passage leading from said vessel, a generally laterally discharging spray nozzle at a discharge end of said passage, with an orifice adapted to emit a fine spray of non-viscous liquid therefrom, and valve and pumping means for developing a pressure in said passage back of said nozzle for causing said non-stick substance to discharge in a fine spray when said substance has been warmed to a temperature level below said cooking surface temperature range but sufficiently high to reduce its viscosity by an amount enabling it to spray from said nozzle, comprising:

a heat conducting stand adapted for support on said heated cooking surface,

said stand comprising a pair of inverted, substantially U-shaped wire forms, each with a pair of legs and an interconnecting, horizontal top segment, in an arrangement with said top segments horizontal and spaced transversely of one another,

a pair of transversely spaced wires extending across and joined integrally to said segments, said wires having at their ends vertical extensions and interconnecting generally arcuate rails furnishing support means to receive and position the lower end portion of said vessel, and

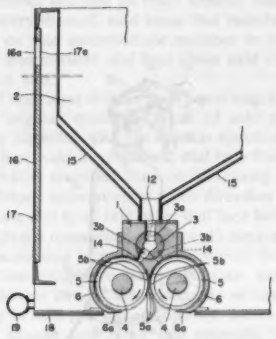
a metal heat conductive platform in the form of a plate mounted on and removably secured to said transversely spaced wires, and provided with notches to pass said extensions in a clamping engagement.

4,011,993

APPARATUS FOR PAINT APPLICATION

Makoto Mizuno; Yoshio Nishiumi, both of Tokyo, and Yukio Nagasaka, Kawagoe, all of Japan, assignors to Atom Chemical Paint Co., Ltd., Tokyo, Japan

Filed May 27, 1975, Ser. No. 580,613
Claims priority, application Japan, Mar. 26, 1975, 50-039372[U]
Int. Cl.² B05B 3/02
U.S. Cl. 239—214 3 Claims



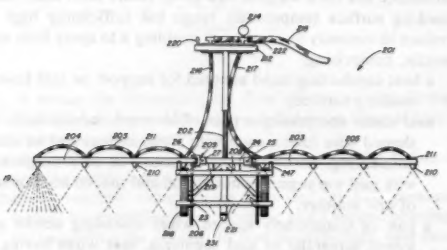
1. An apparatus for paint application comprising a paint supply means incorporating therein a valve means and provided, on its lower portion, with a plurality of paint discharging orifices in two rows in an opposite relation, a tank communicating with said paint supply means for containing a paint, a pair of rollers each provided at the external periphery thereof with a vast plurality of projecting teeth extending in the axial direction of the roller and grooves formed side by side with the projecting teeth, said rollers being attached to said paint supply means to rotate inwardly and located adjacent said orifices, and a pair of cover members associated with said pair of rollers, each said cover member being connected at its one end to the external surface of said paint supply means to cover one of the rollers and having, at its other end, an edge portion which is disposed adjacent the lower side of the respective roller.

4,011,994

TRANSPORTABLE GROUND SPRAYING DEVICE

Richard R. Lenz, 15 Michel Drive, Henrietta, N.Y. 14467

Filed Sept. 18, 1975, Ser. No. 614,477
Int. Cl.² B05B 1/20
U.S. Cl. 239—287 7 Claims



1. A transportable and collapsible ground sprayer comprising:

a. a collapsible frame having an adjustable handle section, a depending leg section and a guide situated therebetween;

b. a pair of inwardly collapsible wheels rotatably attached to the leg section;

c. an elongated support member secured to the frame by said guide, said elongated support member having an upper portion and a lower portion;

d. an adjustable platform attached to the lower portion of the elongated support member said platform having a lower crossbar member, an upper crossbar member and at least two thread bearing members fixedly attached to the upper crossbar member and adjustably connected to the lower crossbar member in a manner such that the distance therebetween can be adjusted by rotating the thread bearing members;

e. a boom support fixedly attached to the upper crossbar member of the adjustable platform;

f. connecting members attached to each end of the boom support;

g. a boom pivotably and hingedly affixed to each end of the boom support by said connecting members wherein each boom is transversely rotatable in a plane parallel to the ground surface and vertically rotatable in a plane substantially perpendicular to the ground surface;

h. nozzles attached to the booms;

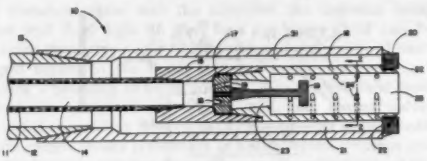
i. a flexible, non-corrosive hose having an inlet attached to the upper portion of the elongated support member and an outlet bearing a fluid conducting relationship to the spray nozzle.

4,011,995

BURNER NOZZLE ASSEMBLY

William F. Krause, Jr., Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 9, 1975, Ser. No. 566,618
Int. Cl.² F23D 15/00
U.S. Cl. 239—404 8 Claims



1. A burner nozzle assembly including: a first hollow elongated body; a second hollow elongated body internal to said first body and spaced from said first body to form an annular space therebetween; said second body having a plurality of openings therethrough near one end thereof providing fluid communication between said annular space and the interior of said second body; a member capping said annular space at said one end; deflector means positioned inside said second body in the vicinity of said openings; a plate member positioned intermediate said first body and said, second body, said plate member having a plurality of openings therethrough, each of said openings being angularly directed tangentially to an internal surface of said second body and outward from said first body to said second body; and said deflector means comprising a stem portion and a flanged head portion mounted on one end of said stem portion, the other end of said stem portion being connected to said plate member.

4,011,996

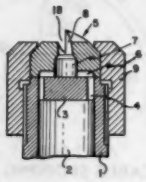
SWIRL TYPE PRESSURE FUEL ATOMIZER

Shoichi Tsuji, Hoya; Minoru Asai, Kamagaya, and Yuichi Fujii, Funabashi, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 405,559, Oct. 25, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,446
Int. Cl.² B05B 1/34
U.S. Cl. 239—491 5 Claims

1. A burner assembly comprising a housing having a passage

for receiving fuel at one end thereof, a nozzle tip extending from said housing and defining an outlet opening in communication with the other end of said passage, and means for imparting a swirl to said fuel as it passes to said nozzle tip for discharge through said outlet, said nozzle tip being frustroconical in shape and having a plurality of sawtooth-shaped



grooves formed therein, each groove defined by a first wall extending from the end of said tip and located in a plane including the longitudinal axis of the tip and a second wall which extends from the base of said first wall to the first wall of an adjacent groove, to divide the fuel discharging from said nozzle tip into a plurality of separate spray patterns.

4,011,997

SPRAY-TUBE COUPLING FOR WASHING MACHINES

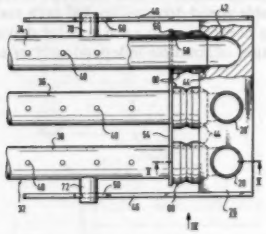
Joachim Klimas, Waldkraiburg, Germany, assignor to Netzsch-Mohnopumpen-GmbH, Self-Bayern, Germany

Filed Aug. 1, 1975, Ser. No. 601,162

Claims priority, application Germany, Aug. 19, 1974, 2439638

Int. Cl.² F16J *15/06*

U.S. Cl. 239—556 **6 Claims**



1. A quick-release spray tube coupling arrangement for washing machines comprising a sealing ring surrounding one end of a spray tube in sleeve-like manner, said sealing ring having a sealing portion with a tapered end, an elastically axially compressible central part supporting and connecting said tapered end on a supporting ring portion fixed on said spray tube in an axial direction, said spray tube extending into an opening in a coupling member with said tapered end of said sealing ring engaging said opening, a lock mechanism clamping said spray tube and subjecting it to a bias toward the coupling opening and subjecting said sealing ring to axial displacement as a whole on the end portion of the spray tube facing the coupling member without changing the shape of said tapered end sealing portion.

4,011,998

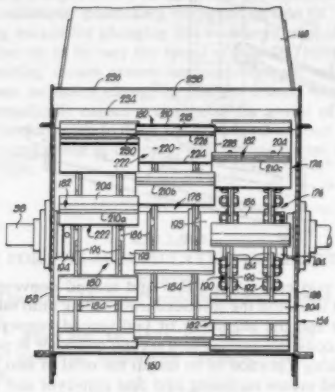
FORAGE HARVESTER HAVING COMBINED CUT-AND-THROW CYLINDER

Adin Frank Holdeman, and Howard James Ratzlaff, both of Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 30, 1975, Ser. No. 627,054

Int. Cl.² B02C *18/18*

U.S. Cl. 241—55 **13 Claims**



1. In a high efficiency crop harvester:

a cutting chamber having a crop inlet and a crop discharge spout spaced from said inlet;

a shearbar adjacent said inlet;

means for feeding crops through said inlet and past the shearbar at a predetermined rate of feed; and

an elongated cutting cylinder rotatable within said chamber across the path of travel of entering crops and cooperable with the shearbar to sever the crops into segments,

said cylinder including at least one elongated cutting means having a longitudinal axis that extends helically and longitudinally around the axis of rotation of the cylinder between the opposite ends of the latter, said cutting means including a plurality of separate, parallel knife segments arranged in longitudinally and circumferentially offset relationship to one another along the longitudinal axis of the cutting means,

said knife segments having cutting edges which define the periphery of the cylinder,

each knife segment being provided with its own radially inwardly disposed cup for receiving crops severed by its knife segment and sweeping the same around the chamber and out the spout,

said cups being elongated and transversely concave with their longitudinal axes substantially parallel to the axis of rotation of the cylinder and substantially perpendicular to said path of travel of the entering crops.

4,011,999

SELF CLEANING TRASH SHREDDER

Walter M. Glaeser, Affton, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

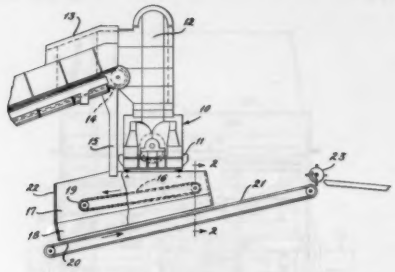
Filed July 2, 1975, Ser. No. 592,633

Int. Cl.² B02C *13/286*

U.S. Cl. 241—79.1 **5 Claims**

1. In trash shredder and conveying apparatus the combination of a trash shredder having a trash receiving inlet and a shredded trash discharge, a first elongated conveyor set at a downward slope to a discharge end and being aligned below said trash discharge to catch the shredded trash and move it to said discharge end, a second elongated conveyor set at an upward slope from a receiving end and being aligned with and

extending in the direction of elongation of and spaced vertically below said first conveyor and having said receiving end spaced from said discharge end of said first conveyor, said second conveyor have a higher linear speed than said first conveyor and also a greater slope than the slope of said first conveyor, said conveyors being spaced farthest apart between said discharge end of said first conveyor and the underlying receiving end of said second conveyor, the vertical spacing



between said ends of said first and second conveyors being sufficient to spread the shredded trash falling onto said second conveyor and the alignment of said second conveyor below said first conveyor placing said second conveyor in position to collect along a portion of its length the offal of said first conveyor, and means enclosing said first conveyor and at least a portion of said second conveyor to confine trash to said conveyors.

4,012,000

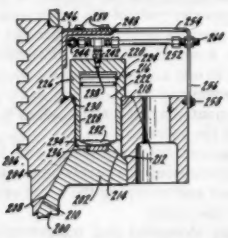
CRUSHING MACHINE CLEARING SYSTEM

D. Carter Davis, Menomonee Falls, and Ulhas S. Sawant, Sussex, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed May 27, 1975, Ser. No. 580,925

Int. Cl.² B02C *2/04*

U.S. Cl. 241—290 **6 Claims**



1. A hydraulic system or bowl release for a gyratory crusher having a circumferential main frame element, a bowl-supporting ring element tiltably mounted on the upper end of the main frame element and constructed to be releasably held down against the main frame element by a spring release, and a plurality of hydraulic jacks arranged circumferentially about and effective between the main frame and bowl-supporting ring elements, the jacks being at least partially countersunk into one of the elements and operative, as a group, to apply an axial thrust to the other element to elevate the bowl-supporting ring element from the main frame element so that the crushing cavity of the crusher may be cleared of uncrushable material, the hydraulic jacks being countersunk into the bowl-supporting ring element, each of the jacks including a cylinder and piston countersunk and screw-threaded down into the bowl-supporting ring element with a substantial amount of the lower portion of the cylinder being positioned inside of the ring element, the lower portion of the cylinder having a thinner wall section than the upper portion with a shoulder between the two portions in engagement with the upper surface of the bowl-supporting ring element, and friction-reducing elements in the upper surface of the main frame element opposite the piston of each of the jacks to create slippage to accommodate side loads during jacking and cavity clearance.

4,012,001

CABLE SPINNING

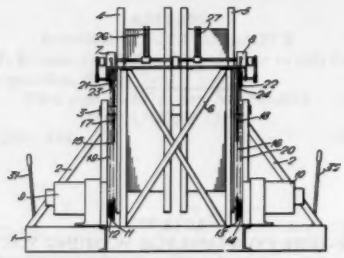
Hugh Stewart Geddes Knox, Broadmead, Dalton Road, Croft, Yorkshire, England

Continuation-in-part of Ser. No. 385,580, Aug. 3, 1973, abandoned. This application Feb. 5, 1975, Ser. No. 547,404

Claims priority, application United Kingdom, Aug. 4, 1972, 36617/72

Int. Cl.² B65H *75/00*

U.S. Cl. 242—54 R **8 Claims**



1. A machine for reeling and unreeling wire for use in an aerial spinning process for forming suspension cables in the construction of a suspension bridge, comprising in combination, a frame including a nonrotatable shaft, two permanently mounted reels for reeling and unreeling said wire, each reel being mounted on said nonrotatable shaft and rotatable about said shaft in either direction, and separate, independent and reversible variable speed drive means for each reel including a positive driving connection to each reel for driving each reel in either direction of rotation independently of each other.

4,012,002

AUTOMATIC COUPLING MECHANISM FOR HOSE REELS

Dean McDonald, and Michael R. Williams, both of Jonesboro, Ark., assignors to FMC Corporation, San Jose, Calif.

Filed May 19, 1976, Ser. No. 687,777

Int. Cl.² B65H *75/00, 75/38*

U.S. Cl. 242—54 R **8 Claims**

1. A reeling apparatus comprising:

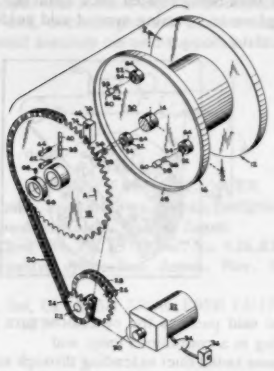
a motor;

a rotatable drive member in driving communication with said motor;

a reel mounted in juxtaposed relationship with said drive member; and

coupling means movably mounted upon said drive member

for engaging said reel when said drive member is moved into a first rotative position and for disengaging said reel



when said drive member is moved into a second rotative position.

4,012,003

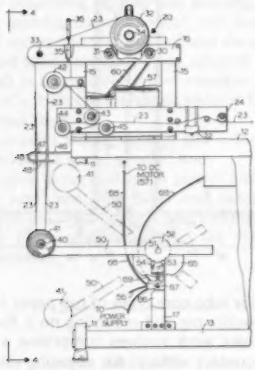
FEEDING AND PROPELLING SYSTEM FOR THE TAPE IN A SEED-TAPE MANUFACTURING MACHINE

Troy L. Cochran; Melvin D. Kirkpatrick, both of Salinas, and Robert J. Walder, Soquel, all of Calif., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 208,281, Dec. 15, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 416,761

Int. Cl.² B65H *17/12, 25/22, 27/00*

U.S. Cl. 242—55 **8 Claims**



1. In a seed-tape manufacturing machine having a main tape driving means for driving tape past a seed-dispensing means, peripheral contact means for engaging the periphery of a drum-like cylinder of tape for positively unwinding it, the combination therewith of:

guide-and-tension means for guiding the unwound tape under tension to said main tape driving means,

said guide-and-tension means including a first shaft adjacent to said peripheral contact means, over which said tape passes, and a second shaft over which said tape passes in tension between said first shaft and said main tape driving means,

a pivoted beam supporting said second shaft for movement toward and away from said first shaft according to the length of said tape, by swinging said beam upon its pivot,

said guide-and-tension means maintaining a substantially constant tape tension even when the relative speeds of tape unwinding and the speed of tape drive are different,

a first centering tape guide secured in a stationary laterally central position between said peripheral contact means and said first shaft,

a DC motor driving said peripheral contact means completely independently of said main drive means,

a potentiometer controlling the speed of said DC motor,

varying means for changing the resistance of said potentiometer so as to vary the speed of said DC motor,

transmitting means connecting said beam to said varying means, so that a change in position in said second shaft automatically causes a change in the speed of said DC motor that tends to drive the peripheral contact means at the same speed as the main tape driving means is driving the tape.

4,012,004

DEVICE FOR THE ACCUMULATION OF MATERIALS IN STRIPS

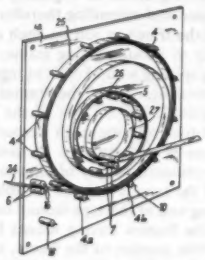
Sylvain Tonellato, 15, rue Pierre Desjardins, 78800 Houilles, France

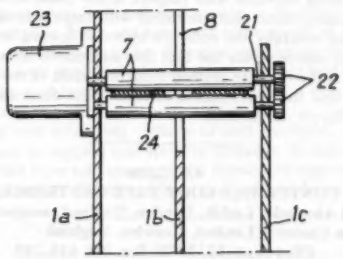
Filed Jan. 16, 1976, Ser. No. 649,940

Claims priority, application France, Jan. 17, 1975, 75.01448

Int. Cl.² B65H *17/48*

U.S. Cl. 242—55.19 R **5 Claims**





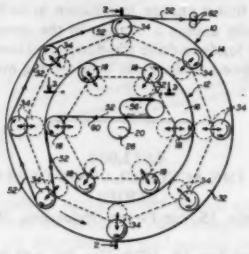
1. A device for the accumulation of elongated strip material of considerable length, said device comprising: an outer cage, an inner cage, said two cages being substantially cylindrical and comprising sets of horizontal rollers mounted for rotation on fixed pivots disposed substantially between two parallel vertical plates, said cages and said plates defining an accumulation space slightly wider than the width of said strip material in which the strip material is accumulated in a single spiral coil comprising at least two turns and forming outer and inner spirals, multiple pairs of gripper rollers for gripping respective strip material spirals to the inside and outside of said inner and outer sprials, respectively, and wherein the inner turn of the inner spiral is nipped at both its ends between at least one

inner pair of said gripper rollers to form a helicoidal floating turn and one of said plates has an opening within the inner cage through which the inner pair of gripper rollers and one end of said helicoidal floating turn protrudes from said accumulation space.

4,012,005
ROTATIONAL TAPE ACCUMULATOR

Harold J. Hattersley, Jr., Bricktown, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Filed Mar. 11, 1976, Ser. No. 665,795
Int. Cl.² B65H *17/02, 17/48*
U.S. Cl. 242—55 **8 Claims**



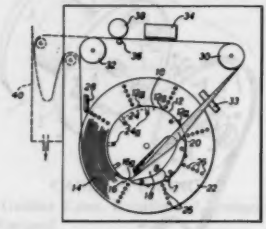
1. A tape accumulator including in combination an inner frame and an outer frame, one of which is rotatable with respect to the other about an axis, each of the frames having a plate portion with a circle of angularly spaced shafts supported by the frame and extending therefrom generally parallel to the axis of the frame, a roll on each of the shafts rotatable with respect to its supporting frame, the rolls of each frame supporting spirally wound reels of tape in the accumulator, means for rotating one of the frames in a direction to wrape tape in spiral layers on one of the frames when said frames have relative rotation with respect to one another during which tape is accumulated by said accumulator for maintaining a continuous supply of tape to a production unit while one end of the tape is stopped for splicing an additional tape to the trailing end of the tape wound on the accumulator, at least one of the frames having means for connecting the shafts with the plate portion of the frame, and the connecting means being movable with respect to the plate in directions having components that are radial with respect to the axis of the plates whereby the rolls are movable inward toward the axis to compensate for the fact that successive layers of tape wound on the rolls are applied from the inside of the spirals of tape so that the inside radius of each spiral decreases as successive layers accumulate.

4,012,006
CONTINUOUS LOOP TAPE CARTRIDGES

Edward Alexander Leshik, London, England, assignor to Hellerman Cassettes Limited, Crawley, England

Filed Sept. 30, 1975, Ser. No. 618,287
Claims priority, application United Kingdom, Oct. 1, 1974, 42550/74; Oct. 1, 1974, 42553/74
Int. Cl.² B65H *17/48*
U.S. Cl. 242—55.19 A **14 Claims**

1. A tape cartridge, comprising:
a. a base;
b. a tape-pack carrier mounted non-rotatively on said base, said tape-pack carrier comprising a cylindrical hub projecting upwards from said base, said hub containing a recess, and an axial slot extending radially inwardly from the periphery of said hub in communication with said recess;
c. tape-guiding means on said base;
d. a length of tape wound as a pack around said hub, said tape passing successively off the innermost turn of said pack, through said slot, in a 90° twisted relation within said recess to a horizontal plane, and over the top of said hub and pack at a point diametrically opposite said slot, said tape then being twisted back again through 90° to a vertical plane and passing around said guiding means to

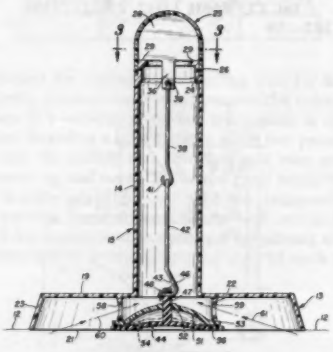


return to said pack as the outermost turn thereof, said tape being in a continuous loop; and
e. at least one radial duct extending through said hub to the cylindrical peripheral surface thereof, to convey air to said pack to provide an air-bearing for the tape at least between said innermost turn and said cylindrical surface of said hub.

4,012,007
PAPER TOWEL HOLDER

Donald W. Cunningham, 1403 S. Dudley St., Lakewood, Colo. 80226

Filed Aug. 1, 1975, Ser. No. 601,247
Int. Cl.² A47K *10/24, 10/32*
U.S. Cl. 242—55.54 **9 Claims**



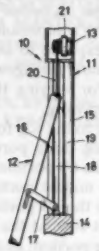
1. A holder for tube core types of roll paper towels adapted for selective positioning and mounting on a flat support surface adjacent user work stations comprising a base element having planar contact surfaces for engaging said support surface at widely spaced apart positions, a standard disposed in normal position with respect to said base and of exterior size for close engagement with the interior of said tube core whereby relative rotation as between said tube core and said standard is frictionally resisted, said base providing a recess therein intermediate opposed contact surfaces of said base, a suction cup within said recess having its outer edges disposed in planar positions with respect to the contact surfaces of said base and, accordingly, in position for contact with said support surface, said suction cup further being isolated and free of major torsion forces that may be exerted by and on said base and standard, actuator means on said standard inclusive of an output element providing translational relative motion with respect to said base and suction cup and, accordingly,

directed toward and away from said support surface, and connector means for the transmission of tension loadings joining the said output element for said actuator means and said suction cup whereby vacuum influences are relieved and induced beneath said suction cup for selectively holding the suction cup and, accordingly, said holder and the contact surfaces thereof securely on said support surface at adjusted positions.

4,012,008
WINDOW SASH BALANCER

Shuichi Hosooka, Namerikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1975, Ser. No. 626,825
Claims priority, application Japan, Nov. 6, 1974, 49-135028[U]
Int. Cl.² B65H *75/48*; E05D *13/12*
U.S. Cl. 242—107 **4 Claims**



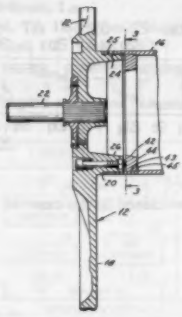
1. A balancer for use with window sashes, comprising in combination:
   a. a housing;
   b. a shaft rotatably supported in said housing and having one end projecting beyond said housing;
   c. a spring member disposed within said housing and having one end secured to said housing and the other end to said shaft, said spring member being adapted to normally bias said shaft in a one direction of rotation;
   d. a drum of a frustoconical shape secured to said projecting end of said shaft;
   e. a wire member wound around and secured to said drum and providing a spiral groove; and
   f. a cord coiled along said spiral groove and having one end fixed to said drum, the other end being adapted to be secured to the window sash, the unwinding of said cord being in the same direction as the tensioning of said spring member.

4,012,009
TEXTILE BEAM

Arthur S. O'Malley, and Eli G. Byrum, Jr., both of Charlotte, N.C., assignors to Hayes-Albion Corporation, Charlotte, N.C.

Filed Oct. 24, 1975, Ser. No. 625,468
Int. Cl.² B65H *75/14*
U.S. Cl. 242—118.62 **9 Claims**

1. In a textile beam including a tubular cylindrical barrel and a pair of heads each attached to one of the ends of the barrel by engagement between threaded portions provided on the head and the barrel,
   the improvement comprising
   retaining means positioned radially inwardly of said threaded portions on the head and the barrel for applying a separating force therebetween in a direction generally parallel to the axis of the barrel, said force increasing the

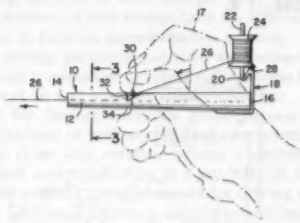


frictional resistance in said threaded portions to relative rotational movement between said head and barrel.

4,012,010
THREAD DISPENSER

Robert W. Friedman, 159 Reynolds Road, West Islip, N.Y. 11795

Filed Dec. 2, 1975, Ser. No. 636,923
Int. Cl.² B65H *49/00*
U.S. Cl. 242—129.8 **3 Claims**



1. A device for dispensing thread from a spool comprising: an elongated tubular handgrip tapering in diameter along its length between front and rear ends respectively of relatively smaller and relatively larger diameter; said handgrip having a notch through its wall at a location intermediate said front and rear ends; said handgrip being proportioned to be gripped in the nature of a pen; a wire secured to the rear end of said handgrip and extending radially of said handgrip, said wire being bent to support said spool of thread at its end; whereby said thread from said spool may be trained through said notch into the interior of said handgrip and out said front end.

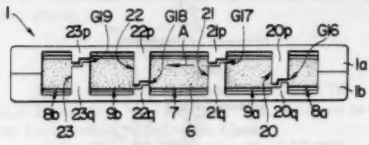
4,012,011
TAPE CASSETTE

Shoichi Saito, Nakano, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1975, Ser. No. 624,482
Claims priority, application Japan, Oct. 21, 1974, 49-121744; Oct. 21, 1974, 49-127660[U]; Oct. 21, 1974, 49-127661[U]; Oct. 21, 1974, 49-127662[U]
Int. Cl.² G03B *1/04*; G11B *15/32*, *23/04*
U.S. Cl. 242—199 **17 Claims**

1. A tape cassette comprising a pair of casing halves which are abutted together, the pair of casing halves including a plurality of frame portions extending therefrom to define a plurality of tape exposure ports, the frame portions disposed in abutting relationship having a complementary configura-

tion to each other and defining a gap therebetween which extends in a direction different from the running direction of



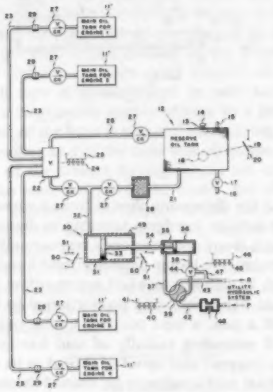
a magnetic tape contained in the cassette along the tape exposure ports.

4,012,012

SUPPLEMENTAL OIL SYSTEM FOR ENGINES

George E. Ligler, Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 30, 1975, Ser. No. 627,123
Int. Cl.² B64D *33/00*
U.S. Cl. 244—1 R **6 Claims**



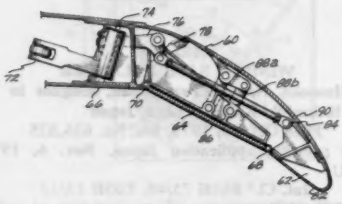
1. The combination with an airplane having a wing with multiple turbo-jet engines and each having an associated main oil tank mounted thereon, of a supplemental oil system to replenish oil in each main oil tank, said system comprising:
   a reserve tank of oil located internally of said airplane;
   a pipeline connecting said reserve tank to each said main tank;
   a container having a measured capacity less than that of said reserve tank located in said pipeline;
   valving in said pipeline operable to permit the flow of oil from said reserve tank to said container and a distribution valve to control the flow of oil from said container to a selected one of said main tanks; and
   a force pump to assure the flow of oil from said reserve tank to said container and to each said main tank when free to do so upon the operation of said valving.

4,012,013

VARIABLE CAMBER INLET FOR SUPERSONIC AIRCRAFT

William Henderson Ball, and Kichio Keith Ishimitsu, both of Mercer Island, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 5, 1976, Ser. No. 655,329
Int. Cl.² B64D *33/02*
U.S. Cl. 244—53 B **2 Claims**



1. In a rectangular cross sectioned air inlet for an engine operatively associated with a supersonic aircraft, the air inlet having an outer surface exposed to ambient air and an inner surface forming the primary passageway for intake of air to the engine, and means for varying the capture area of the primary passageway comprising,
   a. a first ramp mounted to the top forward edge of the inlet, said first ramp having three portions, a fore portion, a middle portion, and an aft portion, the fore portion pivotally mounted to the middle portion, the middle portion pivotally mounted to the aft portion, and, the aft portion mounted to the inlet so that the fore portion can pivot relative to the middle portion, and the middle portion can pivot relative to the aft portion;
   b. a second ramp mounted to the bottom forward edge of the inlet, said second ramp having three portions, a fore portion, a middle portion, and an aft portion, the fore portion pivotally mounted to the middle portion, the middle portion pivotally mounted to the aft portion and, the aft portion mounted to the inlet so that the fore portion can pivot relative to the middle portion, and the middle portion can pivot relative to the aft portion;
   c. actuating means mounted to the inlet for varying said first and second ramps from first positions used when the aircraft is in subsonic flight to second positions used in supersonic flight whereby the capture area of the primary passageway is increased; and
   d. pivoting means for pivoting the fore and middle portions of said ramps relative to each other and the aft portion, said pivoting means being mounted within said ramp and connected to said actuating means.

4,012,014

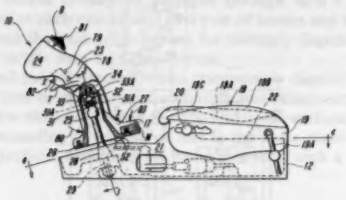
AIRCRAFT FLIGHT CONTROLLER

Lawrence E. Marshall, Ferguson, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Sept. 11, 1975, Ser. No. 612,359
Int. Cl.² B64C *13/04*
U.S. Cl. 244—83 F **7 Claims**

1.An aircraft flight controller for imparting signals to the aircraft attitude controls comprising: a hand grip member, a universal joint device mounted within said grip member to locate the intersection of a plurality of aircraft attitude axes at substantially the center of the fist gripping said grip member, a fixed post supporting said universal joint device such that said hand grip member is free to swing relative to said post and

in directions about any of said axes, and signalling devices operatively connected to said hand grip member at locations



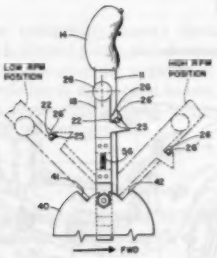
displaced from each other and from said intersection of said axes.

4,012,015

CONTROL AND SYNCHRONIZATION OF TWIN ENGINES WITH A MASTER THROTTLE LEVER

Lewis A. Nelson, Los Angeles, and Herbert L. Cox, Manhattan Beach, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 29, 1975, Ser. No. 644,860
Int. Cl.² B64C *13/04, 13/08*
U.S. Cl. 244—83 F **11 Claims**



1. In an aircraft having two engines, a pilot's throttle lever assembly for speed control and continuous synchronization of said engines throughout their operational range, said lever assembly comprising:

a. an elongated master throttle lever pivotally mounted on a transverse shaft, said master lever having a fixed pin extending laterally therefrom in a parallel direction with said transverse shaft;

b. a first slave throttle lever pivotally mounted on said transverse shaft, linkage connecting means on said first slave lever for connection to a first engine throttle operation linkage, said first slave lever having means defining a locking detent adapted to releasably engage said fixed pin of said master lever to assure unison of movement between said master lever and said first slave lever when said fixed pin is releasably held in engagement with said locking detent by an elastic means; and

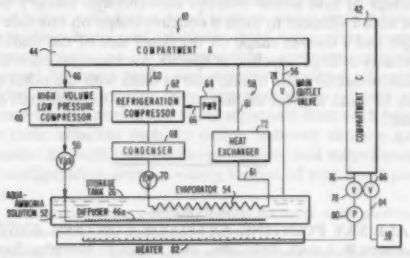
c. a second slave throttle lever pivotally mounted on said transverse shaft, other linkage connecting means on said second slave lever for connection to a second engine throttle operating linkage, said second slave lever having means defining an elongated detent adapted to releasably engage said fixed pin of said master lever to provide for limited movement of said master lever relative to said second slave lever when said fixed pin is releasably held in engagement with said elongated detent by an elastic means and thereby providing means readily allowing for continuous synchronization of said engines by movement of said master throttle lever.

4,012,016

AUTONOMOUS VARIABLE DENSITY AIRCRAFT

Arthur Clyde Davenport, New Orleans, La., assignor to Dynapods, Inc., New Orleans, La.

Filed Sept. 15, 1975, Ser. No. 613,640
Int. Cl.² B64B *1/62*
U.S. Cl. 244—97 **9 Claims**



1. An autonomous variable density aircraft comprising:

an aircraft body,

means defining a variable volume chamber,

means carried by the aircraft body for selectively and reversibly varying the amount of ammonia gas within said variable volume chamber to vary the density of said aircraft,

a storage tank carried by said aircraft body,

a mass of water within said storage tank,

said ammonia gas varying means comprising means for controlling the flow of ammonia gas from said variable volume chamber to said storage tank for diffusion within said water to form an aqua-ammonia solution,

means for driving ammonia gas from said aqua-ammonia solution and transporting released ammonia gas from said storage tank to said variable volume chamber,

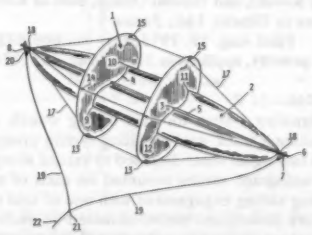
said means for feeding ammonia gas from said variable volume chamber to said storage tank comprises a return extending from said variable volume chamber to said storage tank and terminating in a gas diffuser immersed within said solution and said means for driving ammonia gas from said aqua-ammonia solution comprises heater means operatively positioned with respect to said storage tank for heating said aqua-ammonia solution and driving ammonia gas therefrom by increase in temperature of said aqua-ammonia solution.

4,012,017

ROTARY KITE

Lyle William Springston, 1011 W. Raven Road, Peoria, Ill. 61614, and Richard Lyle Springston, 1014 Main St., Peoria, Ill. 61606

Filed June 8, 1976, Ser. No. 693,742
Int. Cl.² B64C *31/06*
U.S. Cl. 244—153 A **1 Claim**



1. A rotary kite consisting of a single elongated airfoil ele-

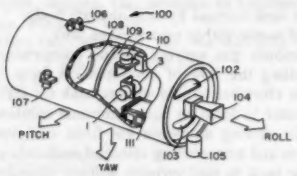
ment rounded at each end, a dowel-type shaft extending from slightly beyond one end of said airfoil element to slightly beyond the other end of said airfoil element, said shaft being mounted upon only one surface of said airfoil element and being centered upon said surface, a pair of circular stabilizer disks mounted on said airfoil element, each disk containing an opening at the center of the disk for passage of said shaft therethrough and an elongated S-shaped slot to accommodate passage of said airfoil element therethrough thereby causing the airfoil element to form a concave shape on one side of the shaft and a convex shape on the other side of the shaft, and a plurality of lines attached at specific locations on each disk for interconnecting one of said pair of disks with the other of said pair of disks and for anchoring the disks to both ends of said shaft.

4,012,018

ALL SKY POINTING ATTITUDE CONTROL SYSTEM

Kenneth R. Lorell, Palo Alto, and James P. Murphy, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 4, 1973, Ser. No. 403,695
Int. Cl.² B64G *1/10*
U.S. Cl. 244—165 **20 Claims**



1. In a space vehicle, an attitude control system comprising:
a sunsensor and a startracker, each having an optical axis, said axes being orthogonally disposed and forming a first set of orthogonal coordinates;
a plurality of strapped-down gyroscopes, each having an input axis, said axes being orthogonally disposed and forming a second set of orthogonal coordinates;
a first means responsive to an output of said gyroscopes for determining the drift of each of said gyroscopes;
a second means for determining the degree of misalignment between said first and said second set of orthogonal coordinates; and
a means responsive to said first and said second means for pointing said vehicle at a predetermined target.

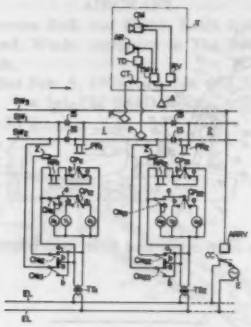
4,012,019

CAR SIGNALING SYSTEM

Hisakatsu Kiwaki, and Hiroshi Okubo, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 19, 1975, Ser. No. 605,832
Claims priority, application Japan, Aug. 26, 1974, 49-97100
Int. Cl.² B61L *21/06*
U.S. Cl. 246—34 R **18 Claims**

1. A signaling system for cars having wheels adapted for running along a track, said signaling system comprising:
at least two signal wires disposed to extend along said track;
main pantograph means mounted on each of said cars for making sliding engagement with one of said signal wires;
subsidiary pantograph means mounted on each of said cars for making sliding engagement with the remainder of said signal wires, said main and subsidiary pantograph means being connected electrically; and
first means for detecting the relative interval between said



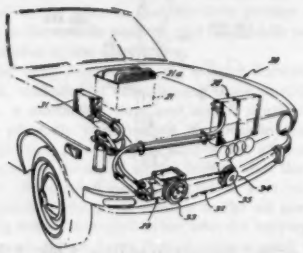
cars in response to the sliding movement of said main and subsidiary pantograph means along said signal wires.

4,012,020

AUTOMOBILE AIR CONDITIONING SYSTEM

Don P. Dixon, and George B. Kobel, both of San Antonio, Tex., assignors to DPD Mfg. Co., Inc., San Antonio, Tex.

Division of Ser. No. 488,735, July 15, 1974, Pat. No. 3,978,814. This application Apr. 25, 1975, Ser. No. 571,505
Int. Cl.² F04B *39/00*; F25B *1/00*
U.S. Cl. 248—14 **7 Claims**



1. A bracket for mounting the compressor of an air conditioning system within an automobile, comprising a base plate having one side for supporting the compressor and slots therethrough to receive bolts for connection to the one side of the compressor, and means for mounting the base plate on the engine block of the automobile, including first and second mounting plates, and an intermediate plate connecting the mounting plates in generally parallel offset planes, only one of the plates of said mounting means being directly connected to one end of the base plate with the first and second mounting plates extending at an acute angle thereto, and each of said mounting plates having bolt holes therethrough.

4,012,021

MULTI-ADJUSTABLE ELECTRIC MOTOR SUPPORT

Rolland R. Duceppe, 2227 1st St., Richelieu, Quebec, Canada

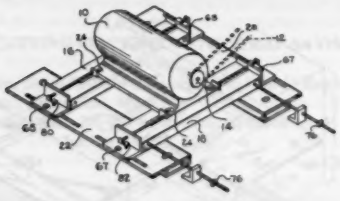
Filed Apr. 9, 1975, Ser. No. 566,367
Int. Cl.² H02K *5/00*
U.S. Cl. 248—23 **2 Claims**

1. A support for mounting a motor in a variety of flat and angular positions, the said support comprising:
a first pair of parallel beams for supporting the said motor, the said first beams comprising a reversed U-shaped cross-section and an L-shaped rigidly secured at each end thereof, each of said first beams being provided with a slot in the upper surface thereof, and two guide means

slidingly mounted in each said slot for abutting against the side of the motor, the said motor being adapted to be releasably secured to said first beams through said slots,

screw means threadedly engaged through said L-shaped plates at each end of said first pair of beams and abutting against the said guide means for slidingly displacing the said motor over said first beams,

a second pair of parallel beams transversely disposed under said first beams, the said second beams being rectangular hollow channels having flat top and lower surfaces, and a lip extending outwardly of and in the same plane as said top surface, each said lip being provided with a slot for



receiving a tightening bolt mounted through said L-shaped plates at the end of said first beams and adapted to immobilize in translation the said first beams, the said top surface of the second beams being provided with holes for receiving bolts adapted to sink below the upper surface of said second beams and secure the lower surface thereof to a base,

spacing means comprising screws threadedly mounted through said L-shaped plates and abutting against the said lip for slightly changing the angle of at least one of the first beams relative to the second beams, the said spacing means being adapted to be fixed relative to said second beams by said tightening bolts.

4,012,022

BREAKAWAY MIRROR MOUNTING

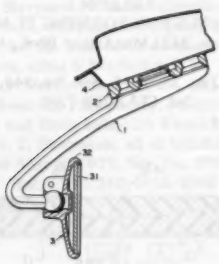
Itsuo Tomita, Hiratsuka, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

Filed Aug. 11, 1975, Ser. No. 603,283

Claims priority, application Japan, Aug. 12, 1974, 49-91532; Aug. 12, 1974, 49-91531

Int. Cl.² A47F 7/14

U.S. Cl. 248—475 A **5 Claims**



1. A breakaway mirror mounting for detachably attaching a rear view mirror device to the interior structure of a motor vehicle comprising:

a mirror;

a mirror supporting arm having said mirror attached at one end of said arm;

a synthetic resin base plate having upper and lower surfaces and constructed for the upper surface to be secured to the interior structure of a motor vehicle; and

means for detaching the mirror and the mirror supporting arm as a whole from the base plate upon application of a force greater than a predetermined magnitude to the mirror supporting arm;

said means for detaching the mirror and the mirror supporting arm comprising an abutting surface provided on the other end of the mirror supporting arm, a supporting surface provided on said lower surface of the base plate, a platform provided on said abutting surface, an engaging projection including a head portion and a neck portion extending from said platform, said base plate having therethrough an accommodation opening partially formed by inner walls, and a pair of resilient engaging strips each extending from opposing edges of said accomodation opening and being separated from each other at their adjacent ends to define between them a gap smaller in width than said head portion, said strips having a configuration corresponding to that of said head portion;

said accommodation opening being formed with slanting surfaces along its lower side edges;

said platform having side surfaces slanting at an angle corresponding to the slanting angle of the slanting surfaces of said opening;

said head portion of said engaging projection having on opposite edges respective lateral protrusions, the upper surface of each said protrusion gradually sloping upwardly toward the top portion of the engaging projection;

said engaging strips having upper and lower surfaces, said upper surface including a portion extending from the inner walls substantially at a right angle, said lower surface being comprised of an upwardly sloping portion and connected thereto at its lower end to said slanting surface and a supporting surface continuously connected to the slanting surface at the lower end of the slanting surface to cause the lower surface to present a gradual upward curvedness so as to impart more thickness to the bottom side of the strip near the inner walls, the connection between the inner walls and the upper surface portion being located outwardly of the connection between the slanting surface and the lower surface portion, for causing the resilient engaging strips to bend at the connection between the slanting surface and the lower surface portion, upon the insertion of said engaging projection into said accommodation opening, to expand said gap so that the strips permit the insertion of the projection and hold the same by its lateral protrusions.

4,012,023

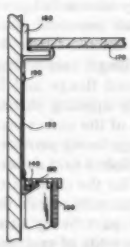
GRID CLIP APPARATUS FOR HANGING PICTURES

James W. Melanson, Concord, N.H., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Mar. 17, 1976, Ser. No. 667,477

Int. Cl.² A47G 1/16

U.S. Cl. 248—489 **2 Claims**



1. A device for hanging pictures and the like from a suspended ceiling border framework comprising:

a first piece secured to the rear of the picture and having a flat elongated flange, two opposed tabs and a flat plate,

the flat plate being secured to the rear of the picture and having a hole through which a nail and the like may be inserted to secure the first piece to the picture, the flange extending downwardly and rearwardly from the bottom end of the flange, and the tabs extending vertically downwardly from the sides of the flange at its rear end;

a hook, the hook having a U-shaped portion that encircles the rear end of the flange and that lies on the top and bottom faces of the flange, and the hook further having a second portion extending upwardly from the forwardmost end of that face of the U-shaped portion which lies on the top face of the flange, with the second portion being generally parellel to the picture and having a hole;

an elongated vertical wire secured at its lower end to the hook by extending through the hole in the hook; and

clip means secured to the upper end of the wire and engaging said framework.

4,012,024

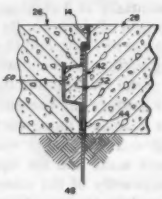
KEY-JOINT FORMING DIVIDER STRIP WITH UPSTANDING SCREED ADAPTED FOR USE WITH CONCRETE SLABS

Peter D. Courtois, Oceanside, Calif., assignor to Superior Concrete Accessories, Inc., Franklin Park, Ill.

Filed Feb. 3, 1976, Ser. No. 654,948

Int. Cl.² E01C *11/04*

U.S. Cl. 249—9 **2 Claims**



1. A forming unit adapted to establish a key-joint between a pair of adjacent concrete slabs, and comprising, in combination, a plurality of horizontally aligned and spaced stakes set with their upper ends positioned uniformly and appreciably below the grade level which is to be established by the upper surfaces of the slabs, and a horizontally elongated divider strip formed of sheet metal, supported on said stakes and bridging the distance between each pair of adjacent stakes, said divider strip having a lower key-joint forming section and an upper substantially planar vertical screed section, said lower section including upper and lower vertical coplanar parts abutting the stakes on one side thereof, and an intermediate laterally offset key deformation portion extending between and connecting said upper and lower coplanar parts, the upper edge of said upper part of said lower key-forming section being provided with a narrow laterally turned flange extending in a direction opposite to that of the key deformation portion, the distal edge of said laterally turned flange being provided with an integral downturned flange, said downturned flange, together with the laterally turned flange and said upper planar part, defining a downwardly opening stake-receiving channel into which the upper ends of the stakes project, the lower edge of said downturned flange being provided with an integral upward fold which establishes said upper vertical screed section and renders the latter for the most part of single thickness, the lateral extent of said laterally turned flange on the upper edge of said upper planar part being substantially equal to the thickness of the upper ends of said stakes whereby such ends are received within said downwardly opening stake-receiving channel with a snug frictional fit, and whereby flexing of said screed section in the direction of the key deformation portion will serve to widen the channel to facilitate entry of the upper ends of said stakes into said channel.

4,012,025

MOLD FOR PLASTICS, PARTICULARLY MULTI-COMPONENT PLASTICS INJECTION MOLD HAVING BLIND CHANNEL

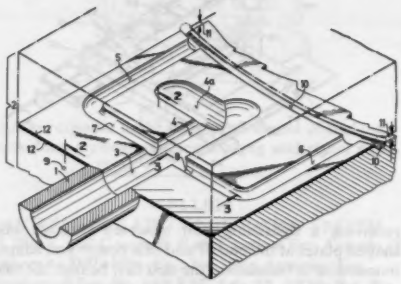
Rudolf Ernst, Munich-Solln; Fritz W. Schneider, Strasslach-Hailafing, and Helmut Clausen, Strasslach-Munich, all of Germany, assignors to Firma Elastogran Maschinenbau GmbH & Co., Munich, Germany

Filed Apr. 10, 1975, Ser. No. 566,692

Claims priority, application Germany, Apr. 13, 1974, 2418247

Int. Cl.² B29F *1/00*

U.S. Cl. 249—105 **3 Claims**



1. In a mold for multi-component plastics wherein cooperating mold sections confront each other at plane surfaces and cooperate with each other to define a plastics-receiving portion and a mold cavity communicating with the plastics-receiving portion to receive plastics therefrom, th plastics-receiving portion including a sprue runner, a blind channel with an inlet end in unobstructed open communication and longitudinal alignment with the sprue runner and having substantially the same cross-sectional flow area as the sprue runner, the inlet end being the only plastics flow access to the blind channel, and a sprue runner branch in communication with the sprue runner and intersecting the sprue runner in a direction transversely of the sprue runner, the sprue runner branch delivering plastics to the mold cavity, the sprue runner branch having a significant restriction to flow of plastics from the sprue runner as compared to the free flow of plastics through the unobstructed open communicaton into the blind channel from the sprue runner, the restriction being located adjacent the intersection of the sprue runner branch with the sprue runner.

4,012,026

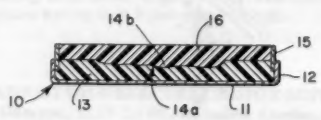
APPARATUS FOR FORMING PLAQUES

Denzil G. Chambers, 2432 MacArthur Blvd., Apt. 104, Irving, Tex. 75062

Filed Jan. 27, 1975, Ser. No. 544,506

Int. Cl.² B28B *7/06*

U.S. Cl. 249—134 **9 Claims**



1. An apparatus for producing plaques by impression molding comprising:

a. an impression frame having a base section and upstanding wall sections;

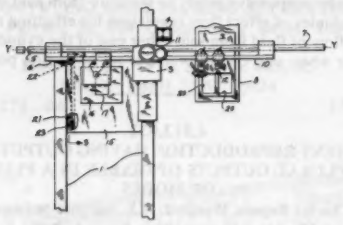
b. a plastic impression retaining means capable of receiving and retaining an impression, said impression retaining means being disposed within said impression frame and supported by the base of said impression frame; and

c. a molding frame having upstanding walls defining a continuous wall section with open ends, said molding frame fitted wholly within the upstanding wall sections of said impression frame and supported by said plastic impression retaining means such that the lower edge of said continuous wall section sealedly engages said plastic impression retaining means with the upper edge of said continuous wall section extending above said plastic impression retaining means thereby forming the mold defined by the surface of said plastic impression retaining means and the upstanding continuous wall section of said molding frame.

4,012,027
METAL CUTTING MACHINE WITH SCRAP SAVING FEATURE

Harry Hooper, Brookfield, Wis., assignor to C-R-O Engineering Co., Inc., Brookfield, Wis.

Filed Mar. 24, 1976, Ser. No. 670,048
Int. Cl.² B23K 7/02
U.S. Cl. 266—58 **6 Claims**

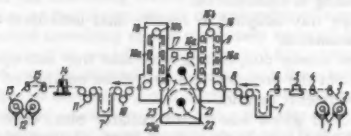


1. In a machine for cutting a plurality of identical parts from a plate-like workpiece wherein a tracing head is adapted to follow a template mounted on a cutting table for driving a workpiece cutting head through a plurality of successive cutting cycles: selectively actuatable means for shifting said template a pre-selected fixed distance automatically at the end of one cutting cycle to thereby re-position said template for the next succeeding cutting cycle.

4,012,028
FURNACE OF A CONTINUOUS METAL STRIP HEAT-TREATMENT PLANT

Vladimir Izrailevich Dunaevsky, ulitsa Oktyabrskoi Revoljutsii, 17, kv. 9, Slavyansk; Nikolai Mikhailovich Krikly, ulitsa Parkovaya, 69, kv. 67; Eduard Sergeevich Kotelevets, ulitsa Parkovaya, 3, kv. 25, both of Kramatorsk; Vladilen Nikolaevich Apterman, ulitsa V.Maslovka, 8, kv. 207; Mikhail Ilich Oginsky, ulitsa Zhukovskogo, 2, kv. 16, both of Moscow; Stanislav Tikhonovich Pliskanovsy, prospekt Lenina, 62, kv. 13, Zhdanov, and Boris Ioinovich Kaushansky, ulitsa Karla Marxa, 28, kv. 2, Slavyansk, all of U.S.S.R.

Filed May 8, 1975, Ser. No. 575,965
Int. Cl.² C21D 9/56, 9/68
U.S. Cl. 266—103 **3 Claims**

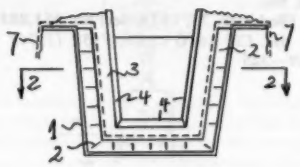


1. A furnace for a continuous metal strip heat treatment plant comprising: a heat-insulated cell having an inlet and an outlet for the metal strip; heating elements arranged within said cell, and means for moving said strip within said cell in the course of heat treatment, said means including: at least a pair of coiling drums disposed substantially parallel to each other and having separable segments split along the longitudinal plane of said drums for clamping said strip and coiling it in a bifilar manner and uncoiling it successively on said drums; drives for reversing the rotation of said drums and further drives for opening and closing said segments; at least a pair of guide rolls disposed within said heat-insulated cell, one of the guide rolls of said pair of rolls being arranged within said cell at the inlet for said strip and intended for alternately feeding the strip to the coiling drums before it is coiled thereon in a bifilar manner, and the other one of said guide rolls of said pair being arranged within said cell at the outlet for said strip for alternately discharging the strip from the coiling drums after the bifilar coil has been wound; each of the rolls of said pair of guide rolls being mounted within said cell on a carriage to move thereon for feeding the strip into the coiling drums and discharging it therefrom in a plane substantially parallel to the plane passing through the axes of rotation of the coiling drums; and drive means for moving said carriages.

4,012,029
TUNDISHES

Claude Seguin, Orgeval, and Bernard de Wiet, Valence, both of France, assignors to Foseco Trading A.G., Chur, Switzerland

Filed July 30, 1974, Ser. No. 493,893
Claims priority, application United Kingdom, July 30, 1973, 36185/73
Int. Cl.² C21B 3/00
U.S. Cl. 266—275 **12 Claims**



1. In a tundish comprising an outer metal casing and a permanent lining of refractory material adjacent the casing, the improvement which comprises providing a layer of essentially unbonded particulate refractory material adjacent and parallel the permanent lining and, adjacent the layer of particulate refractory material and in parallel spaced relation to the permanent lining, an expendable lining made up of a set of slabs of refractory heat-insulating material.

4,012,030
FIXTURE FOR PRECISION POSITIONING OF WORK PIECES

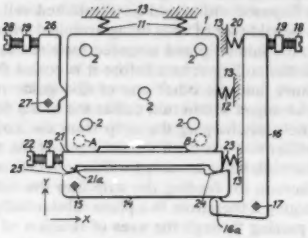
Tore Gottfrid Hesselgren, Johanneshov, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 10, 1975, Ser. No. 612,259
Claims priority, application Sweden, Sept. 20, 1974, 7411857
Int. Cl.² B23Q 1/04
U.S. Cl. 269—60 **4 Claims**

1. A device for precision positioning of work pieces on the work table of a machine tool, said device comprising in combination:

a fixture in the form of a substantially rectangular plate disposed parallel to the work table and rotatable and displaceable relative thereto in two non-linear directions; first spring means pressing the fixture against said work table; a bar disposed adjacent to one edge of said fixture parallel thereto and pivotal about one end; second spring means disposed at the edge of the fixture opposite to said one edge and biasing the fixture toward said bar for dis-

placement of the fixture in one direction; a two-arm first lever, one arm being parallel to another edge of the fixture and the other arm underlying said bar for pressure coaction therewith in opposition to the second spring means, said first lever being pivotal about a point intermediate the two arms; and a first positioning means coacting with said one arm of the first lever for pivoting the other arm into pressure coaction with said bar for selectively pivoting the same thereby rotating the fixture against the action of the second spring means.

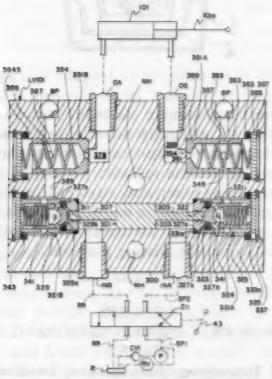


4,012,031

LOCK VALVE FLOW CONTROL ARRANGEMENT

Larry D. Mitchell, Ballwin, and Edward M. Mason, St. Louis, both of Mo., assignors to Affiliated Hospital Products, Inc., St. Louis, Mo.

Filed Mar. 25, 1975, Ser. No. 561,885
Int. Cl.² A61G *13/00*; F15B *13/042*
U.S. Cl. 269—325 **4 Claims**



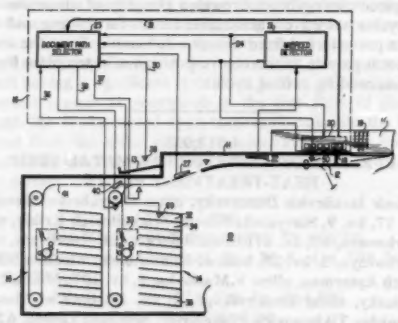
1. In combination, an operating table having a top for supporting a patient, means for adjusting the top for variably positioning the patient including at least one double-acting hydraulic cylinder, a reservoir for hydraulic fluid, a foot pedal operated hydraulic pump having an inlet receiving fluid from the reservoir and an outlet for delivery of fluid under pressure on operation of the pedal, a control valve having an inlet receiving fluid from the pump outlet, an outlet for returning fluid to the reservoir, and first and second transfer ports, said control valve being adapted to be set in a closed position blocking the transfer ports, a first open position for delivery of fluid under pressure through said first port and venting of the second port to the reservoir and in a second open position for delivery of fluid under pressure through said second port and venting of said first port to the reservoir, and flow control means in the system between said control valve and said cylinder comprising means providing a first passage interconnecting said first port and one end of said cylinder and a second passage interconnecting said second port and the other end of the cylinder, a first check valve in the first passage arranged to open in response to setting of the control valve in its said first open position and operation of the pump for delivery of fluid under pressure to said one end of the cylinder, a second check valve in the second passage arranged to open in response to setting of the control valve in its second position and operation of the pump for delivery of fluid under pressure to said other end of the cylinder, means responsive to delivery of fluid under pressure to the first check valve to open the second check valve and responsive to delivery of fluid under pressure to the second check valve to open the first check valve, first pressure responsive flow regulating means in said first passage between the first check valve and said one end of the cylinder responsive solely to pressure from said one end of the cylinder to effect flow regulation for effecting relatively smooth flow of fluid from said one end of the cylinder to the reservoir when said control valve is set in its second position, and second pressure responsive flow regulating means in said second passage between the second check valve and said other end of the cylinder responsive solely to pressure from said other end of the cylinder of effect flow regulation for effecting relatively smooth flow of fluid from said other end of the cylinder to the reservoir when said control valve is set in its first position.

4,012,032

DOCUMENT REPRODUCTION HAVING OUTPUT MEANS WITH PLURAL OUTPUTS OPERABLE IN A PLURALITY OF MODES

James Charles Rogers, Wyckoff, N.J., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,250
Int. Cl.² B65H *29/60*
U.S. Cl. 271—64 **5 Claims**



1. Document reproduction apparatus for selectively making one or more individual duplicate documents from an original document, or for making a number of collated document sets of a multi-page original document,

including in combination:

a copy tray adapted to receive said individual duplicate documents;

a first sensor cooperating with said tray and operable to detect the presence of a first given number of duplicate documents therein;

a second given number of collator bins, each said bin adapted to receive a third given number of duplicate documents;

second sensor means cooperating with said bins and operable to indicate the presence of said third given number of duplicate documents in one of said bins;

document deflector/conveyor means operable to selectively

convey duplicate documents from a copier to said tray and to said bins, such that duplicate documents are sequentially deposited in the first to the Nth bin;

operator control means enabling selection of a copy or collate mode of operation;

automatic control means actuatable by said operator control means and constructed to facilitate a copy request for a number of noncollated copies greater than said first given number or a collate request for a number of collated sets greater than said second given number; and

document path control means in said automatic control means responsive to said first and second sensor means, and having means operable to control said sheet deflector/conveyor means to route all noncollate duplicate documents to said tray when a copy request is less than said first given number; and to

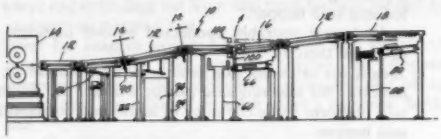
route said first given number of duplicate documents to said tray and thereafter route no more than said third given number of duplicate documents copies to each of said bins.

4,012,033

CONVEYING AND STACKING APPARATUS

John C. Parrish, II, 504 Conquistador Drive, Largo, Fla. 33540

Filed Apr. 24, 1974, Ser. No. 463,785
Int. Cl.² B65H *21/62, 29/24*
U.S. Cl. 271—64 **17 Claims**



12. An apparatus for conveying and stacking individual sheets of material, said device comprising:

a first means for conveying individual sheets disposed adjacent to a sheet producing source and arranged to receive sheets from said source;

a second conveying means which may be disposed in a first position for receiving and transporting the sheets from said first conveying means, said second conveying means also being movable to a second position which prevents the sheets from being received and transported by said second conveying means;

means disposed adjacent to said second conveying means for reversing the direction of conveyance of sheets which have passed from said first conveying means when said second conveying means is disposed in said second position;

air jet means disposed adjacent to said second conveying means and arranged to operatively urge the sheets toward a third conveying means when said second conveying means is in said second position;

stacking means for receiving sheets transported from said third conveying means;

wherein the conveying means are disposed above a floor surface or the like by means of a plurality of supports;

said second conveying means is pivotally secured at a first end thereof to one of said supports and has a second end which may be displaced in relation to a floor surface or the like so that said second conveying means is movable to first and second positions and a plurality of positions therebetween by being pivoted about said first end;

wherein an actuating means disposed adjacent to said second end is arranged to pivotally move said second conveying means;

wherein said actuating means comprises a hydraulic cylinder having an arm which is operatively connected to said second conveying means so that said second conveying means may be pivoted to a plurality of positions upon actuation of said hydraulic cylinder; and

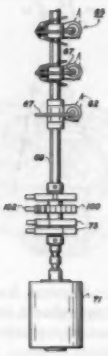
wherein said air jet means comprises a plurality of nozzles disposed above a passline of conveyance of the sheets from said first conveying means when said second conveying means is disposed in said second position, said air jet nozzles providing for jets of air to be forced onto the sheets thereby urging the sheets toward said third conveying means, said reversing means preventing the sheets from being displaced beyond a predetermined distance along the passline from said first conveying means, said nozzles being movable with said second conveying means.

4,012,034

MULTIPLE MODULAR SORTER SYSTEM

John A. Nelson, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1975, Ser. No. 616,796
Int. Cl.² B65H *29/58*
U.S. Cl. 271—173 **1 Claim**



1. An improved control system for modular sorter assemblies which distribute copy sheets into bins in collated sets from document information reproduced by a copier/duplicator machine comprising:

a plurality of modular sorter assemblies operative to receive copy sheets sequentially,

an array of sorting bins in each assembly to receive copy sheets in collated sets,

gate members associated with each of the bins to deflect copy sheets thereinto from a sheet path,

gating means operative to control the distribution of copy sheets into the next modular sorter assembly after sorting is completed in the bins in a particular assembly,

a cam member associated with each assembly, said cam member having a plurality of cam indents with each indent corresponding to an associated gate member or gating means and arranged for controlling the opening and closing of said gate members and gating means in a predetermined sequence,

drive means for rotating said cam member and actuating said gate members and gating means, and

circuit means including a photodetector means operating two contacts which are opened and closed as sheet presence and absence is detected at the bins entrance and switching means associated with said contacts and activated by said cam member for energizing said drive means to actuate said gate members and said gating means in proper sequence in response to the presence and absence of copy sheets at the entrance of the bins,

wherein said switching means includes a single pole double throw switch which changes state from a first condition when said cam member rotates to position a predeter-

mined detent at said switch to a second condtion when said cam member further rotates to move said predetermined detent away from said switch,

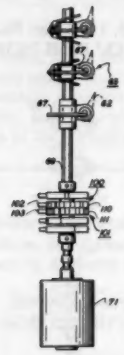
wherein the movement of the cam member occurs for both the presence and absence of sheets at the bin's entrances.

4,012,035

SORTER CONTROL SYSTEM

John A. Nelson, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1975, Ser. No. 616,797
Int. Cl.² B65H *29/58*
U.S. Cl. 271—173 **2 Claims**



1. An improved control system for modular sorter assemblies which distribute copy sheets into bins in collated sets from a document information reproduced by a copier/duplicator machine comprising:

a plurality of modular sorter assemblies operative to receive copy sheets sequentially,

an array of sorting bins in each assembly to receive copy sheets in collated sets,

gate members associated with each of the bins to deflect copy sheets thereinto from a sheet path,

gating means operative to control the distribution of copy sheets into the next modular sorter assembly after sorting is completed in the bins in a paricular assembly,

first and second cam members associated with each sorting assembly, each cam member having a plurality of cam indentations with each indentation corresponding to an associated gate member or gating means, said indentations on said first cam member being offset from indentations on said second cam member, said cam members being arranged for controlling the opening and closing of said gate members and gating means in a predetermined sequence,

drive means for rotating said cam members and actuating said gate members and gating means,

circuit means including a photodetector means operating two contacts which are opened and closed as sheet presence and absence is detected at the bins' entrance and switching means for energizing said drive means to move said cam members and to actuate said gate members and said gating means in proper sequence in response to the presence and absence of copy sheets at the entrance of the bins,

wherein said switching means includes two single pole single throw switches, each switch being operated by an associated cam member when said cam member is rotated,

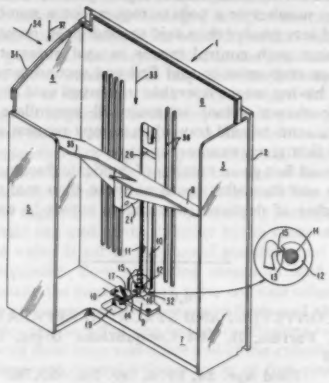
wherein the movement of the cam members occurs for both the presence and absence of sheets at the bins' entrances.

4,012,036

DOCUMENT HOPPER

Gary Leo Sokol, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 10, 1976, Ser. No. 694,864
Int. Cl.² B65H *43/04*
U.S. Cl. 271—215 **10 Claims**



1. A hopper for receiving documents in an orderly manner when sequentially fed thereinto, said hopper comprising:

a. a platform upon which said documents are stacked when fed into said hopper;

b. a leadscrew operably connected to said platform and rotatable thereby; and

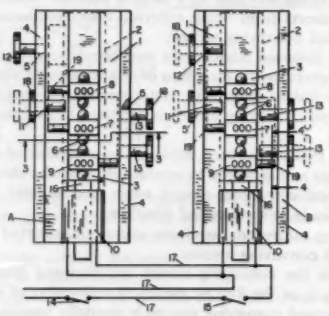
c. means for releasing said leadscrew for rotation in one direction for lowering said platform under the weight of said platform for acceptance of additional documents in said hopper.

4,012,037

SCORE KEEPING UNITS

Vernon Kinser, McDonald Township, Barry County, Mo. 65677

Filed Dec. 8, 1975, Ser. No. 638,933
Int. Cl.² A63B *71/06*
U.S. Cl. 273—1 ES **7 Claims**

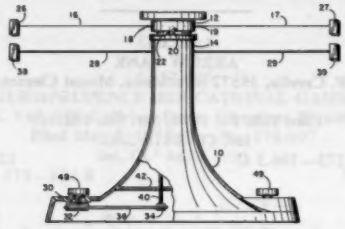


1. In scoring units of the kind described, in combination, a plurality of counters, a carriage on which said counters are mounted, a plurality of pin means to actuate said counters, said pin means being shiftable into position to trip said counters, solenoid operators disposed to move said carriage, and controlling means to control said carriage movement whereby when the pin means are shifted into said trippable positions and said controlling means operated, the carriage is moved by said solenoid to cause said pin means to trip said counters.

4,012,038
MAGNETIC TOY

Gregory R. Brotz, 25 N. Point Drive, Sheboygan, Wis. 53081

Filed Mar. 3, 1976, Ser. No. 663,463
Int. Cl.² A63F 9/00
U.S. Cl. 273—1 M 8 Claims

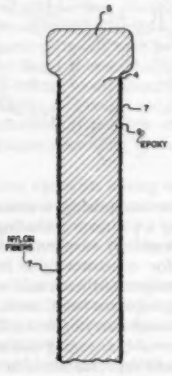


1. A magnetic toy comprising:
a casing;
a rotatable pivotal member on top of said casing having a plurality of apertures located on its outer circumference;
a pivotal member rod, one end of which is inserted into one of said apertures;
a pivotal member bar magnet rotationally mounted at the other end of said pivotal member rod;
a neck section of said casing located below said pivotal member;
a lower rod extending out from said neck section parallel to said pivotal member rod;
a lower bar magnet mounted at the end of said lower rod positioned below said pivotal member bar magnet wherein said pivotal member bar magnet and said lower bar magnet are affected by each other's magnetic field; and
means for rotating said lower rod.

4,012,039
PERMANENT FORM-FITTING, NON-SLIP COVER FOR HANDGRIPPING PORTION OF BASEBALL BATS, GOLF CLUBS AND THE LIKE

Herman Yerke, Largo, Fla., assignor to Joe Hall, Jr., Clearwater, Fla.

Continuation-in-part of Ser. No. 379,200, July 13, 1973, abandoned. This application July 22, 1974, Ser. No. 490,778
Int. Cl.² A63B 59/06, 53/14
U.S. Cl. 273—72 R 1 Claim

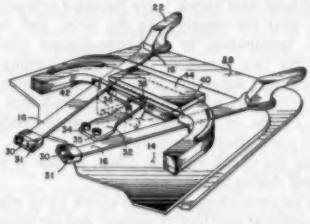


1. In combination with a baseball bat having a hand-gripping portion, a slip-resistant cover for said hand-gripping portion, said cover comprising:
a coating of epoxy of substantially uniform thickness disposed in surrounding relation to said hand-gripping portion of the baseball bat;
said coating of epoxy being directly applied to said hand-gripping portion of the baseball bat;
a plurality of nylon fibers having longitudinal dimensions between 30 and 90 mils;
one end of each of said plurality of said fibers being directly imbedded in said coating of epoxy on the hand-gripping portion of the baseball bat;
the other end of each of said plurality of said fibers extending outwardly from said coating of epoxy on the hand-gripping portion of the baseball bat, and
said plurality of said fibers covering substantially the entire exposed surface of said coating of epoxy on the hand-gripping portion of the baseball bat.

4,012,040
MAGNETIC HOCKEY GAME

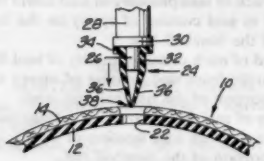
Gilbert Fernandes, 238 Robert St., Westport, Mass. 02790

Filed May 17, 1976, Ser. No. 686,785
Int. Cl.² A63F 7/06, 7/10
U.S. Cl. 273—85 A 12 Claims



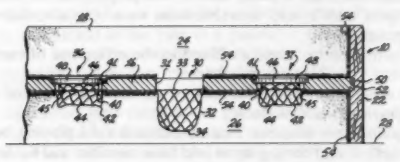
1. A manually-operated magnetic game having forward player-pieces and goalie player-pieces having magnets affixed to their bases arranged upon a playing board surface, said player-pieces movable by magnets located under said playing board surface, said game comprising:
a plurality of movable arm members having said magnets located under said playing board surface mounted at one end, each of said movable arm members being associated with one of said forward player-pieces;
a base member located below said playing board surface upon which said movable arm members are slideably positioned;
an arm member handle affixed to the other end of each of said movable arm members;
an elevated rink border affixed to the perimeter of said playing board surface;
a goalie arm member located beneath said playing board surface and resting upon said base member and having an aperture defined therein;
a goalie arm member magnet affixed at one end of said goalie arm member;
a goalie arm member pivot affixed to said base member and extending into said aperture within said goalie arm member;
a guide restraining member positioned above said goalie arm member having a recess defined therein to allow pivotal movement of said goalie arm member upon said goalie arm member pivot; and
a guide member laterally slideably positioned under said guide restraining member having a guide member slot defined therein arranged to engage the other end of said goalie arm member so that lateral force applied by a movable arm member against said guide member causes said goalie arm member to pivot causing said goalie arm member's associated goalie player-piece located on said playing board surface to move in front of its goal.

4,012,041
GAME BALL REPRESSURIZING METHOD
Allan C. Hoffman, 5876 Republic Ave., Riverside, Calif. 92504
Filed Oct. 20, 1975, Ser. No. 623,795
Int. Cl.² A63B *39/04, 41/12*
U.S. Cl. 273—61 D **1 Claim**



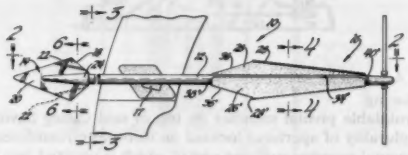
1. The method of repressurizing a dead inflatable game ball having an imperforate hollow rubber shell, comprising the steps of:
   1. drilling a hole through the rubber shell, using a tool that removes material and leaves a cylindrical hole in the shell;
   2. inserting an inflation check valve of soft resilient rubber into the hole, said check valve having a cylindrical barrel portion that fits snugly into the hole, and said barrel portion terminating in a wedge-shaped configuration formed by two opposed, converging, sealing lips that come together separably along a line of contact at their inner extremities to open the valve and seal the valve against escape of air when the pressure inside the ball exceeds atmospheric pressure;
   3. securing the check valve in place, so that it will not be dislodged during violent play; and
   4. forcing air through the inflation check valve whereby said lips separate at said line of contact and air passes into the interior of the ball.

4,012,042
INVERTIBLE POCKETED TARGET FOR A DISC THROWING GAME
Steve J. Blasingame, 1111 12th Ave., Yuma, Ariz. 85364
Filed Jan. 19, 1976, Ser. No. 650,060
Int. Cl.² A63B *67/06*
U.S. Cl. 273—95 R **5 Claims**



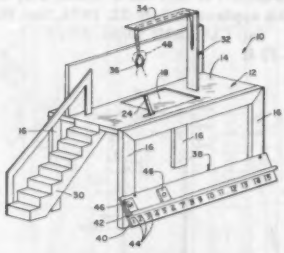
1. A game apparatus comprising:
   a. at least one target structure having a first and a second tray-shaped openings facing oppositely with respect to each other;
   b. a floor in said target which forms a common bottom for the first and the second tray-shaped openings thereof;
   c. said target having an upright position in which the first tray-shaped opening thereof is facing upwardly and an inverted position in which the second tray-shaped opening thereof is facing upwardly;
   d. said floor having a central projectile receiving all formed therein and having a plurality of satellite projectile receiving wells formed therein in an array about said central well, said central well and said satellite wells each having a scoring value;
   e. each of said satellite wells including a pocket means, said pocket means affixed to said floor for closing said satellite wells in the upright position of said target and for forming projectile receiving containers in the inverted position of said target; and
   f. a plurality of projectiles for throwing at said central well when said target is in its upright position and for throwing at said central well and said satellite wells when said target is in the inverted position thereof.

4,012,043
ARROW VANE
Richard F. Carella, 35572 Strathcona, Mount Clemens, Mich. 48043
Filed Feb. 14, 1974, Ser. No. 442,419
Int. Cl.² F41B *5/02*
U.S. Cl. 273—106.5 C **12 Claims**



2. An arrow comprising a shaft with a forward end and a rearward end, first support means extending tangentially from said shaft, a first vane extending laterally from said first support means at a position spaced from said shaft and on the same side of said first support means as said shaft so as to extend over said shaft, said first vane being disposed with the spacing between said first vane and said shaft decreasing from the end of said first vane nearest the forward end of said shaft to the end of said first vane nearest the rearward end of said shaft to define a pocket of decreasing volume from front to rear.

4,012,044
HANGMAN GAME APPARATUS
James Grossi, 101 Twin Rivers Drive, Toms River, N.J. 08753
Filed Oct. 1, 1975, Ser. No. 618,329
Int. Cl.² A63F *3/00*; **A63H** *3/16*
U.S. Cl. 273—130 E **3 Claims**

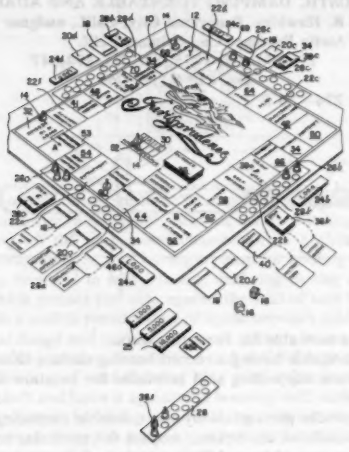


1. A hangman game comprising: a miniature three dimensional gallows having a platform including an operable trap door and a noose pendently suspended over the trap door; component means for constructing a representation of a human figure to be suspended from said noose, said component means including separate head, torso, arm and leg components; said components carrying mutually engageable magnetic buttons for removably engaging said components to each other to construct said representation in steps starting with said head component; said head component being proportioned to be carried in said noose.

2. The game of claim 1 further comprising a plurality of blocks having letter indicia thereon, and a rack for said blocks

secured to said platform for indicating correctly guessed letters of a preselected word.

4,012,045
JURISPRUDENCE -EDUCATIONAL GAME
James N. Vail, 900 Golfview Drive, Glenview, Ill. 60025
Filed May 5, 1975, Ser. No. 574,697
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 B **7 Claims**



1. An entertaining and teaching game device comprising:

A game board having a plurality of various different discrete areas thereon which are arranged in a continuous path, said discrete areas including areas having identification thereon for cooperation with a plurality of game elements which have related identification thereon;

A plurality of marker pieces for marking movement along said path of two or more players;

Means for determining by lot increments of advance of marker pieces of successive players so as to position said marker pieces of said various discrete areas;

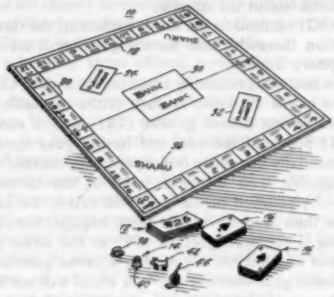
A plurality of game elements adapted for distribution to the players which game elements each have at least two faces with one of the faces thereof having an identification thereon which is related to the identification on certain of said discrete areas on said board and the other one of said faces having information thereon which requires a response by the player according to the knowledge of the player;

Certain of said game elements having on said other one of said faces information which requires the player to exercise his judgement according to his knowledge as to how best to respond in order to further his progress toward obtaining reward indicators;

Certain others of said game elements having information on said other one of said faces which enables the player to respond according to his knowledge and to obtain or lose reward indicators; and

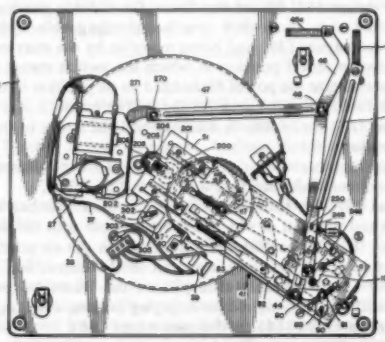
A plurality of reward indicators which are distributable to the players in accordance with their correctness in responding to the information on said game elements and to the positioning of said markers on certain of said discrete areas.

4,012,046
GAME OF SKILL AND CHANCE
Hendrik Liket, 32 Bergen Blvd., Fairview, N.J. 07022
Filed June 9, 1975, Ser. No. 585,072
Int. Cl.² A63F *3/00, 9/14*
U.S. Cl. 273—134 C **8 Claims**



1. In a game apparatus, the combination of a game board having a continuous path around its perimeter divided into consecutive spaces bearing instructions representing amounts to be paid or received during the game, each of said spaces defining a playing position, a plurality of playing pieces one for each of the game players, said playing pieces being of a size to fit within said playing positions, play money of different denominations for distribution of part thereof to each player, and at least two decks of standard playing cards for distribution of at of least some of the cards in equal allotment to each of the players, the cards simultaneously bearing indications representing the number of playing positions to be moved by a playing piece and also bearing representations forming a part of win determining means, said game board further comprising a bank area for storing the remainder of the play money not distributed to the players and said apparatus further comprising a plurality of additional cards, all of a single type, said single type being one of the types already included within each of said decks of playing cards.

4,012,047
AUTOMATIC RECORD CHANGER
Secundino Rodriguez Sandoval, Mexico City, Mexico, assignor to Investigaciones Tecnologicas Electromecanicas y Electronicas, S.A., Mexico City, Mexico
Filed Mar. 5, 1975, Ser. No. 555,557
Int. Cl.² G11B *15/00*
U.S. Cl. 274—10 R **11 Claims**



1. An automatic record changer for playing phonograph records comprising:

a frame (21),

a turntable (22) rotatably mounted on the frame, the turntable having an upper surface for supporting records to be played and a lower surface and a center opening,

power means (27) for rotating the turntable,

switch means (39) for energizing the power means,

a record spindle (23) received by the center opening of the turntable and secured to the frame, the turntable being rotatable about the spindle,

a gear (62) secured to the lower surface of the turntable for rotation therewith and having gear teeth on the outer periphery thereof,

a cam wheel (56) rotatably mounted on a shaft (57) on the frame below the lower surface of the turntable, the cam wheel having a cam groove (111) and a cam surface (114) provided thereon and having gear teeth around substantially the entire outer periphery thereof which are engageable with the gear teeth of the turntable gear whereby rotation of the gear will rotate the cam wheel when their respective gear teeth engage, the cam wheel having a recessed portion (59) in the outer periphery thereof which is not engageable with the gear teeth of the turntable gear whereby the cam wheel will not be rotated by the gear when the recessed portion of the cam wheel faces the gear,

an elongated tone arm (24),

a shaft (125) supporting the tone arm and extending generally perpendicularly thereto, the shaft being rotatably mounted on the frame whereby rotation of the shaft moves the tone arm over the outer surface of the turntable,

an elongated slide bar (116) having a pair of ends and extending in a direction generally perpendicular to the axis of rotation of the cam wheel, a cam follower (138) on one end of the slide bar positioned on the cam groove (111), the cam groove being shaped to slide the slide bar longitudinally from a first to a second position and back to the first position as the cam wheel makes one revolution,

translating means (135, 142, 170) movably mounted on the frame and operably connected to the other end of the slide bar and to the tone arm shaft (125) for translating sliding movement of the slide bar into rotational movement of the tone arm shaft,

abutment means (65) movably mounted on the cam wheel (56) and engageable with the turntable gear (62) for rotating the cam wheel when the abutment means engages the turntable gear so that the cam wheel gear teeth engage the teeth of the turntable gear and the cam wheel continues to rotate for one revolution,

cam start means (104) movably mounted on the frame for moving the abutment means into engagement with the turntable gears,

a switch arm (82) slidably mounted on the frame,

start means (44, 80) on the frame for slidably moving the switch arm, the switch arm being engageable with the switch means (39) and being movable by the start means between an off position in which the switch means does not energize the power means and an on position in which the switch means energizes the power means,

means (85) for resiliently biasing the switch arm to the off position,

a stop member (92) pivotally mounted on the frame for movement between first and second positions,

means (97) for resiliently biasing the stop member to its second position in which it is engageable with the switch arm (82) for holding the switch arm in the on position,

a stop bar (221) slidably mounted on the frame, and

a slide (200) movably mounted on the frame below the spindle and having a cam-engaging portion engaging the cam surface (114) on the cam wheel (56),

a spring (210) urging the cam-engaging portion of the slide against the cam surface, the cam surface being shaped to permit movement of the slide between extended and retracted positions as the cam wheel rotates,

the stop bar (221) being engageable by the slide (200) when the slide moves to its retracted position, engagement of the stop bar by the slide moving the stop bar into engagement with the stop member (92) and pivoting the stop member toward its first position to permit movement of the switch arm to the off position.

4,012,048

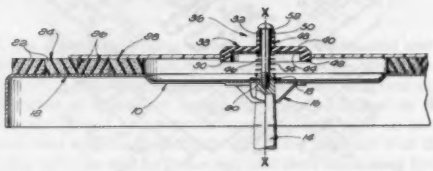
ACOUSTIC DAMPING TURNTABLE AND ADAPTER

William R. Hawkins, Panorama City, Calif., assignor to Newcomb Audio Products Co., Sylmar, Calif.

Filed May 2, 1975, Ser. No. 574,047

Int. Cl.² G11B 3/60

U.S. Cl. 274—39 R **1 Claim**



1. In a turntable for recording discs:

a. a turntable having a record bearing surface thereon;

b. means supporting said turntable for rotation about its axis;

c. a spindle pin carried by the turntable extending axially upwardly of the bearing surface for centering recording discs on said turntable;

d. a sleeve guidingly mounted on said spindle pin for slidable movement thereon;

e. means determining an upward limit to the movement of said sleeve;

f. spring means carried by the turntable for urging said sleeve towards its said upper limit;

g. a composite integral adapter ring of acoustic damping material and secured to said sleeve for mounting thereby and movement as a unit therewith, said adapter ring having an upper small diameter part and a lower large diameter part adapted respectively to engage the spindle holes of larger and smaller diameter recording discs;

h. said composite adapter ring also having a substantially flat pad part at the base of said small diameter part and extending to the top of said large diameter part;

i. means forming a recess in said turntable for receiving said adapter ring with said pad part coplanar with said bearing surface when said pad part is engaged by a recording disc with a smaller spindle hole;

j. said spring yielding upon application of the weight of said smaller spindle hole recording disc;

k. the coupling between said spindle pin and said recording discs for centering thereof being dependent upon the acoustic camping material of said adapter ring;

l. said record bearing surface comprising a pad of foam rubber-like acoustic damping material, said pad having a plurality of surface separated contiguous interfitted annular sections, the innermost annular section forming at least the upper part of said turntable recess, acoustic vibrations from the turntable to a recording disc mounted on said bearing surface being dependent for their transmission either upon said pad or said composite adapter ring.

4,012,049
FLOATING RING SEAL MEANS

Dietrich Lambrecht; Erich Weghaupt, both of Mulheim (Ruhr); Lothar Grimm, and Helmut Munch, both of Frankenthal, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

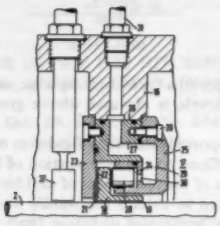
Filed Oct. 31, 1974, Ser. No. 519,623

Claims priority, application Germany, Nov. 2, 1973, 2354998

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.[2] F16J *15/34, 15/40*

U.S. Cl. 277—27 **8 Claims**



1. In a rotating shaft machine having a housing and a pressurized chamber, floating ring seal means for rotating shafts for sealing off the pressurized chamber from a chamber at atmospheric pressure, and having a pump for cooling liquids; a floating ring seal in said housing, said ring having a radial flange which presses one side against the wall of said housing to provide a seal to prevent flow of liquid between said side of said radial flange and said housing wall, pistons located in the housing acting on the other side of said radial flange to avoid radial vibration of said floating ring with vibration of the rotating shaft and force it against the housing wall, said pistons being connected to and pressurized by a pressure source whose pressure increases proportionally to an increasing number of rotations of the rotating shaft.

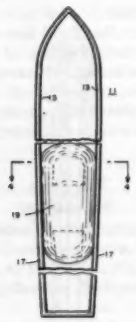
4,012,050
SKI PROTECTOR

Charles Miller, 17 Sutro Heights, San Francisco, Calif. 94121

Filed Sept. 29, 1975, Ser. No. 617,650

Int. Cl.[2] A63C *11/20*

U.S. Cl. 280—11.38 **4 Claims**



1. A ski protector comprising an elastic boot formed of one piece polybutylene rubber and having a sole portion with continuous walls therealong in the outline of a ski, the walls being of a height slightly greater than thickness of a ski and having upper inwardly projecting flanges for partially overlapping the upper surface of a ski, the portions of the ski protector formed for disposition along the edges of the skis being formed of a greater depth of cross-section thickness to insulate the edges of the skis from damage or causing damage when brought into contact with another object, said boot being formed to permit it to be stretched over the bottom and sides and the edges of the top surface of the ski such that the sole portion is positioned against the bottom of the ski with the sides of the ski closely surrounded by the walls of the boot and the edges of the upper surface of the ski being overlapped by the inwardly projecting flanges on the walls,

mating releasable strips affixed across the bottoms of the soles of the boots in opposed mating relation such that when the skis are pressed with their bottoms in abutting relation the adhesive strips will engage each other to secure the boots together for transporting the skis enclosed therein as a single unit, and

a protective cover for the safety bindings of skis, said cover being formed to seal with the upper surface of a ski disposed in said boot around said binding and to encapsulate said binding thereunder, said cover being held in position by having its lateral edges captured under the flange portions of said ski protector proximate said bindings when said protector is fitted onto said ski.

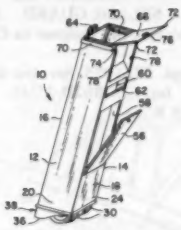
4,012,051
GOLF CLUB CARRIER

Donald N. Embinder, 1029 Harrison St., Hollywood, Fla. 33020

Filed Dec. 23, 1975, Ser. No. 643,862

Int. Cl.[2] B62B *1/20*

U.S. Cl. 280—47.19 **5 Claims**



1. A golf club carrier device comprising: an elongated rigid walled golf bag; ground engaging wheel means rotatably mounted on the bottom of said golf bag; rest means projecting downward from the bottom of said golf bag for engaging the ground when said bag is in substantially upright orientation; and plate means movably mounted at the top of said golf bag for selectively either being positioned for covering said golf bag or being positioned to serve as a handle for translating said golf bag on said wheel means.

4,012,052
DEVICE FOR LIMITING PIVOTAL MOVEMENTS OF A LAWN MOWER HANDLE

Karl Torsten Lennart Engdahl, Malmo, Sweden, assignor to Flymo Societe Anonyme, Zug, Switzerland

Filed Oct. 2, 1975, Ser. No. 618,801

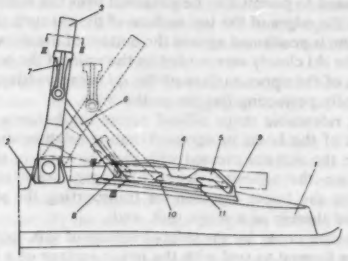
Claims priority, application United Kingdom, Oct. 11, 1974, 44073/74

Int. Cl.[2] B62B *11/00*

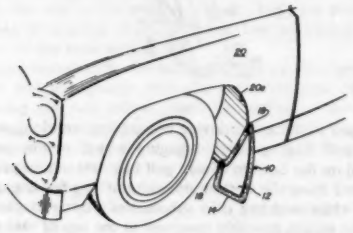
U.S. Cl. 280—47.37 R **1 Claim**

1. A device for limiting the pivotal movements of a lawn mower handle pivotally connected to a lawn mower housing, characterised by a connecting link which at one end is pivotally connected to a part of said handle and at the other end protrudes into a slot arranged in an element rigidly connected to the housing, the said slot limiting the vertical movements of the said link other end, the said slot being provided with

branched-off, blind-end slot parts which the said link other end may leave only by a reverse movement followed by a manual elevating movement wherein the said link has a portion extending through said handle and secured to a resilient fork part for arresting said handle at a pre-determined relative angle between said link and said handle.

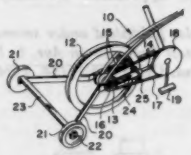


4,012,053
SPLASH GUARD
Robert G. Bode, Chicago, Ill., assignor to Custom Accessories, Inc., Skokie, Ill.
Filed Sept. 22, 1975, Ser. No. 615,787
Int. Cl.² B62D *25/16*
U.S. Cl. 280—154.5 R **3 Claims**



1. A splash guard for attachment to the normally curved fender of a vehicle consisting of: a resilient, flexible, splash-prevention, one-piece body portion, the outer edges of which are normally thin and have a knifelike sharpness, a permanent, unitary, continuous, flexible, protective border intimately bonded to and covering entirely the outer edges of the one-piece body portion to prevent contact by the hand of a user of the splash guard with the normally thin and sharp edges of the body portion, said protective border having substantially flattened sides which extend inwardly from the outer edges of the body portion and overlie only the marginal areas of the body portion adjacent to the outer edges thereof on both sides of the body portion, said protective border being formed of a material which is different from the material of which the body portion is formed and being flexible with and remaining intimately bonded to the outer edges of the body portion when the splash guard is flexed to enable it to conform to the normal curvature of a fender of a vehicle, and spaced openings through the protective border and the body portion along a margin of the splash guard for receiving fasteners by means of which the splash guard is attached to the fender of a vehicle.

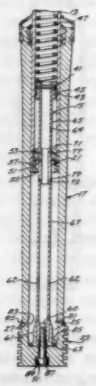
4,012,054
BICYCLE SAFETY DEVICE
Paul A. Moore, 9825 Park Lane Court, Dallas, Tex. 75220
Filed Nov. 19, 1975, Ser. No. 633,272
Int. Cl.² B62D *63/00*
U.S. Cl. 280—239 **5 Claims**



1. A safety apparatus for stabilizing a bicycle when the front wheel of said bicycle is elevated above ground level which comprises:

a. a pair of oppositely disposed rigid arm means adapted to be rigidly affixed to the rear portion of said bicycle, one on each side of the rear wheel of said bicycle, and further being adapted to extend rearwardly and outwardly in a substantially horizontal direction from the rear axle of said bicycle when both the rear and front wheels of said bicycle are in contact with the ground, said rigid arm means terminating at ends spaced apart and rearward of the rear wheel of said bicycle;
b. means for rigidly affixing said rigid arm means to the rear portion of said bicycle;
c. a pair of roller wheels having a diameter substantially smaller than the diameter of said rear wheel of said bicycle;
d. means to affix one of each of said roller wheels in rotatable relationship to each of said arm means adjacent the ends thereof; and
e. a brace means to affix to the ends of said arm means to rigidly hold said ends in spaced-apart relationship.

4,012,055
METHOD AND APPARATUS FOR EXTENDING A MOTORCYCLE FORK
Robert J. Ottow, 6815 San Vicente, Paramount, Calif. 90723
Filed Mar. 22, 1976, Ser. No. 669,030
Int. Cl.² B62K *25/08*
U.S. Cl. 280—276 **6 Claims**



1. A motorcycle fork extension for extending the travel of a

motorcycle fork of the type including a downwardly biased damper rod having a head on the bottom end thereof and a fork slider fitted telescopically over the bottom extremity of a fork tine receiving such rod, said extension comprising:

a damper rod extension of a selected length received medially in said rod and having the opposite ends thereof affixed to the ends of upper and lower sections of said damper rod;

a slider extension affixed to the lower end of said slider and including an upwardly opening cylindrical registration chamber of at least said selected lengths for receipt of said head; and

means affixing the bottom end of said damper rod to said extension.

4,012,056

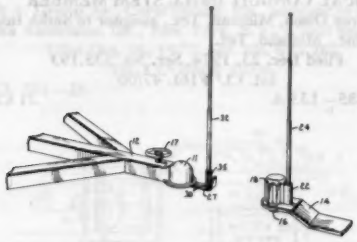
VISUAL GUIDE DEVICE FOR HITCHING VEHICLES

Justin D. Christensen, 6808 W. 69th St., Overland Park, Kans. 66204

Filed Dec. 29, 1975, Ser. No. 644,533

Int. Cl.² B60D *1/06*

U.S. Cl. 280—477 **6 Claims**



1. A guide device for assisting in the positioning of a first vehicle having a hitch ball with respect to a second vehicle having a hitch socket, said guide device comprising:

a first sight member for sighting by the vehicle driver;

a ball member coupled with said first sight member to mount same to said hitch socket, said ball member being removably insertable in said socket and fitting tightly therein to mount said first sight member in generally upward extension from said socket to a height visible to the driver;

a second sight member for sighting by the vehicle driver; and

a mounting member coupled with said second sight member to mount same to said hitch ball, said mounting member attaching directly to said hitch ball to mount said second sight member in generally upward extension therefrom to a height visible to the driver for positioning in proximity to said first sight member, whereby said ball and socket are positioned in proximity to one another.

4,012,057

SKI BRAKE

Guy Courvoisier, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge-Geneva, Switzerland

Filed Feb. 4, 1976, Ser. No. 655,265

Claims priority, application Switzerland, Feb. 6, 1975, 001469/75

Int. Cl.² A63C *7/10*

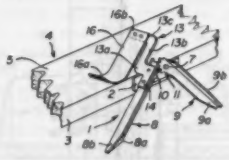
U.S. Cl. 280—605 **12 Claims**

1. A self-arresting ski including a runner and a brake operative upon removal of a skier's boot from an upper surface of said runner, said brake comprising:

a pair of spurs pivotally mounted on a lateral face of said runner at longitudinally spaced locations;

coupling means interconnecting said spurs for joint rotation in opposite directions about axes transverse to said lateral face;

treadle means extending from at least one of said spurs above the upper surface of said runner for depression by a skier's boot secured to the runner, said treadle means upon such depression maintaining said spurs in a retracted position of substantial mutual alignment alongside said lateral face; and



biasing means for exerting upon said spurs a force tending to swing said spurs from said retracted position into a working position in which said spurs diverge downwardly with lower extremities projecting beyond a lower surface of said runner while pointing in opposite directions.

4,012,058

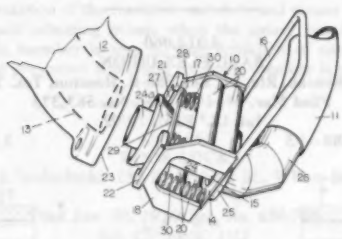
MAGNETIC COUPLER FOR ENGINE EXHAUST DUCTS

James E. Patton, R.R. No. 3, 1950 Beery Road, Elida, Ohio 45807

Filed Feb. 17, 1976, Ser. No. 658,411

Int. Cl.² F16L *25/00*

U.S. Cl. 285—9 M **4 Claims**



1. A coupler for an exhaust duct of an engine block of magnetically attractable metal comprising a generally U-shaped bracket of magnetizable metal adapted to be placed in contact with the magnetic engine block, permanent magnets carried by said bracket and so arranged as to magnetize the bracket sufficiently that it will engage and hold itself to said exhaust duct, a spring tensioned gas tube carried by and having limited movement within said bracket and adapted to be spring urged to align with the engine exhaust duct for conducting the products of combustion therefrom, and collars on said tube spaced from each other for limiting gas tube movement in opposite directions, one collar engagable with said bracket, and an apertured plate through which said tube slides for engagement by the other collar.

4,012,059

PIPE CONNECTOR

Robert R. Luke, and Edmund A. Fisher, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

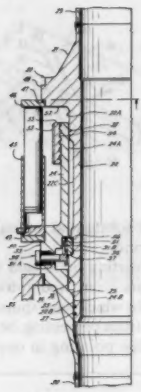
Filed Sept. 8, 1975, Ser. No. 611,259

Int. Cl.² F16L *55/00*

U.S. Cl. 285—18 **17 Claims**

1. A pipe connector, comprising first and second tubular members having telescopically interfitting end portions, means for latching the end portions of the tubular members

against separation when so interfitted, means for sealing the end portions with respect to one another when so latched, one of said members being stretchable so as to preload the latching means, and an externally manipulatable part connected to the second member for axial movement with respect thereto, said



part and said first tubular member having oppositely facing shoulders which move axially away from one another as said one member is stretched, whereby said part may be manipulated to move the shoulder thereon against the shoulder on the first member so as to hold the preload on the latching means.

4,012,060

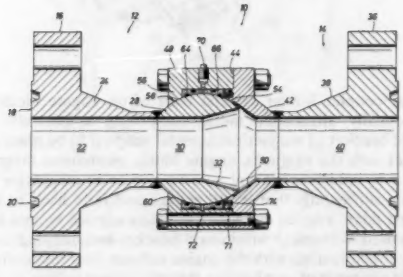
BALL FLEX UNION

Bobby J. Reneau, Rte. 11, Box 380-B, Houston, Tex. 77039

Filed Mar. 31, 1975, Ser. No. 563,373

Int. Cl.² F16L *19/02*

U.S. Cl. 285—93 **5 Claims**



1. A pipe fitting for use with non aligned pipes, comprising

a male member;

a female member;

said male member comprising

a connective pipe portion;

a ball at the end of said pipe portion having an axially aligned passage therethrough and connected with said pipe portion

said female member comprising

a connective pipe portion;

an encircling housing means having a hollow cylindrical portion which communicates with the connective pipe portion;

seal means located in said housing means of said female portion, said seal means having two facing portions and jointly having a spherically contoured exposed face for contact against said ball which face encircles said ball and which further permits rotation of said ball in said housing means to continue sealing against leakage, said seal including a means for preventing leakage between said seal means and said housing means;

said means further being constructed and arranged to clamp said ball in said housing means and limit movement thereof from said housing means except rotation which is permitted;

wherein said housing means includes

a flanged flared receptacle connected to said pipe portion;

an axial hollow tubular housing;

an internal, encircling shoulder on each of said receptacle and said tubular housing, said shoulders having a curved conforming face which captures said ball therebetween; and

wherein said encircling shoulders are formed on separable members including said receptacle and said housing which align and join together axially about said ball.

4,012,061

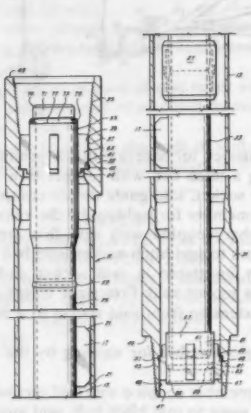
DUAL CONDUIT DRILL STEM MEMBER

Wallace Fred Olson, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed Dec. 23, 1974, Ser. No. 535,193

Int. Cl.² F16L *47/00*

U.S. Cl. 285—133 A **31 Claims**



1. Dual conduit drill stem member comprising:

outer and inner tubular elements disposed one about the other and separated radially providing a flow passage therebetween as well as a flow passage through the inner tubular element,

connection means at each end of the drill stem member for making connections with correlative means on adjacent drill stem members to transmit tension, torsion and compression therebetween and to provide fluid communications between the inner tubular element of the drill stem member and the inner element of the adjacent members and between the outer tubular element of the drill stem member and the outer member of the adjacent members, and

means interconnecting the inner tubular element with the outer tubular element at both ends of the inner tubular element, the inner tubular element including two portions connected together by coupling means including a portion having a lower elastic modulus than that of said two portions of the inner tubular element, said coupling

means providing fluid communication and transmitting mechanical loads between said two portions of the inner tubular element,

said coupling means comprising a steel collar including two parts whose adjacent ends are telescopically connected and a rubber sleeve bonded to the interior of the collar at both parts thereof,

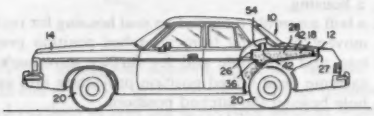
the two parts of the collar being threaded interiorly and the ends of the two portions of the inner tubular element connected by said coupling means being exteriorly threaded and screwed into said threaded collar parts.

4,012,062

SANDING DEVICE FOR A MOTOR VEHICLE

Joseph A. Gropp, Sr., Coral Spring, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 16, 1975, Ser. No. 623,265
Int. Cl.² B60B *39/06*
U.S. Cl. 291—25 **1 Claim**



1. A sanding device for a motor vehicle adapted for depositing a non-skid substance at a controlled rate forwardly of each rear wheel, which comprises:

a. a roof of said motor vehicle having an interior chamber therein adapted to receive said non-skid substance therein;

b. a pair of chutes communicating in fluid serial connection with said chamber, each said chute extending downwardly to a point forwardly of each said rear wheel, each said chute having a lower open opening;

c. a deflector shield affixed to said open lower end of each said chute;

d. a pair of U-shaped channel flanges affixed to said lower end of each said chute;

e. a pair of slide plates, one of said slide plates slidably disposed in each said pair of U-shaped flanges for opening and closing each said lower end of each said chute;

f. a pair of springs, one of each said springs communicating between each said plate and each said chute for normally keeping each said chute closed;

g. a shift lever adapted to be pivotally mounted on an interior floor of said motor vehicle;

h. a Y-shaped cable assembly, a stem of said cable assembly affixed to said shift lever, a free end of each arm of said cable assembly affixed to one of said plates;

i. means for injecting said non-skid material into said chamber through said roof of said motor vehicle;

j. a float ball disposed in said chamber, said ball lighter than said non-skid material disposed in said chamber;

k. one end of a pivot arm affixed to said float valve;

l. a microswitch adapted to be mounted on said motor vehicle, said microswitch affixed to another end of said pivot arm; and

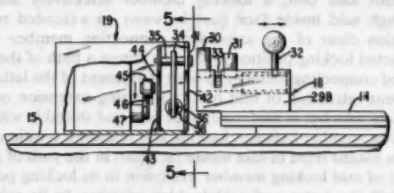
m. a light means adapted to be mounted in a dashboard of said motor vehicle, said light means wired in series to said microswitch and a battery of said motor vehicle.

4,012,063

INTERLOCK LATCH ASSEMBLY FOR CENTRIFUGALS

John W. Sherlock; George R. Haigh, both of East Moline, and Donald L. Ropp, Colona, all of Ill., assignors to Ametek, Inc., New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 631,691
Int. Cl.² B04B *7/06*
U.S. Cl. 292—57 **6 Claims**



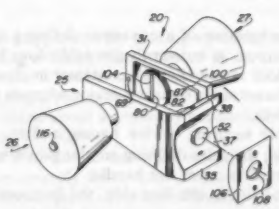
1. In an apparatus having a rotatable member enclosed in a housing and actuable by power means and an access cover to said rotatable member mounted on said housing and pivotable between open and closed positions, the combination of a slidable and rotatable locking bolt on one of said access cover and said housing and slidably and rotatably movable between locked and unlocked positions when the cover is in its closed position, first and second keys on the inner end of said bolt, pivoted pawl latching means on the other of said housing and access cover for latching said locking bolt in its locked position for energizing said power means, fluid operated means pivoted to one end of and for means actuating said pawl latching means for releasing said latching means, means responsive to the rotation of said rotatable member for prevention of energization of said releasing means when the rotatable member rotates so that said releasing means cannot be actuated during rotation of the rotatable member, and means for energizing said releasing means when the rotary speed of said rotatable member is zero so that actuation of said release means is prevented while said rotatable member is rotating.

4,012,064

DOOR LOCK

Joseph J. Malacheski, 130 E. Division St., Wilkes-Barre, Pa. 18702

Filed Jan. 20, 1976, Ser. No. 650,706
Int. Cl.² E05C *1/12*
U.S. Cl. 292—169.18 **2 Claims**



1. A door lock comprising a generally U-shaped body for mounting astride a door edge, said body including inside and outside face parts for location on opposite sides of a door and a bridging part connecting said face parts and extending across the door edge, a bolt shiftably mounted in said bridging part for movement between an extended locking position and a retracted open position, inside manual actuating means rotatably carried by said inside face part, outside manual

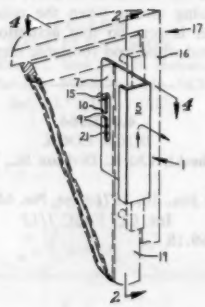
actuating means rotatably carried by said outside face part, linkage means interconnected between each of said actuating means and said bolt for selectively retracting and extending the latter upon actuating means rotation, said linkage means comprising a rotary member in the respective face part connected to the associated actuating means for rotation thereby, and a connecting member connected between said bolt and the respective rotating member for movement with the latter to shift said bolt, a locking member selectively shiftable through said inside face part between an extended release position clear of the associated connecting member and a retracted locking position extending across a path of the associated connecting member to limit movement of the latter and prevent retraction of said bolt, a releasing extension on said locking member in said inside face part and shiftable with said locking member between locking and releasing positions, and guide means fixed in said inside face part in the path of movement of said locking member extension in its locking position to shift the latter and said locking member to its releasing position upon rotation of said inside actuating means.

4,012,065

CONTAINER SECURING DEVICE

Clair J. Miller, 5813 NE. 35th Place, Portland, Oreg. 97211

Filed June 16, 1975, Ser. No. 587,374
Int. Cl.² E05C *19/18*
U.S. Cl. 292—288 **1 Claim**



1. The combination of a container defining a door frame with a pin thereon, an outwardly pivotable door having a door handle, the door attached to the container in closable relation to the door frame and a securing device wherein the improvement comprises:

a removable securing device having a first, second, and third side, the sides defining an elongate U-shaped channel adapted to cover the handle;

a horizontal slot in the first side, the horizontal slot intersecting

a vertical slot to form a passageway containing a substantially 90° angle;

the first side removably attached to the container between the door frame and the door so that during attachment of the securing device, the slot engages the pin on the door frame sequentially, the first engagement being along the horizontal slot and the second engagement being along the vertical slot;

and upon attachment the second and third sides substantially surround and cover the door handle;

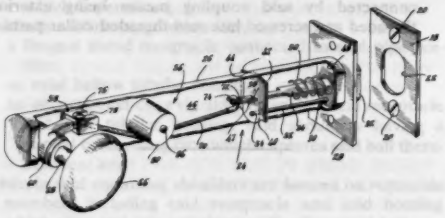
whereby outward opening of the door is prevented.

4,012,066

LOCK ASSEMBLY FOR AUTOMATICALLY DEAD BOLTING A CLOSURE

Ronald M. Salvatore, Stamford, Conn., assignor to Accurate Lock and Hardware Co., Stamford, Conn.

Filed Oct. 28, 1975, Ser. No. 626,343
Int. Cl.² E05B *15/02*
U.S. Cl. 292—341.13 **15 Claims**



1. A lock assembly for automatically dead bolting a closure, such as a fire safety door, to a closure frame, such as a fire safety door jamb, in the event of fire raising the ambient temperature about a predetermined temperature, said lock assembly comprising:

A. striker plate means, for defining a bolt hole, mounted on one of said closure and closure frame;

B. a cooperating latching assembly mounted on the other of said closure and closure frame and including.

1. a housing,

2. a bolt assembly mounted on said housing for reciprocal movement to and from a latched position projecting into said bolt hole and for further movement to an extreme dead bolted position projecting into said bolt hole beyond the latched position,

3. stop means operable when said bolt assembly is moved to the dead bolted position to prevent movement of said bolt assembly out of said dead bolted position,

4. means for urging said bolt assembly toward the dead bolted position; and

5. bolt actuator means for moving said bolt assembly to and from its latched position and ultimately to its dead bolted position, said actuator means comprising,

a. crank means,

b. substantially inextensible cable means for interconnecting said crank means and said bolt assembly, and

c. means, disintegratable at the predetermined temperature,

1. for guiding said cable means through a first nonlinear path of active length sufficient only to permit said bolt assembly to be reciprocated to its latched position; and

2. for disintegrating at the predetermined temperature to permit said cable means to traverse a second path of active length sufficient to permit said bolt assembly to be reciprocated to the dead bolted position.

4,012,067

REFUSE COLLECTION DEVICE

Donald P. Travis, 25292 Staysail Drive, Dana Point, Calif. 92629

Filed Sept. 29, 1975, Ser. No. 617,518
Int. Cl.² A01K *29/00*
U.S. Cl. 294—19 R **6 Claims**

1. A refuse collection device comprising:

an elongated handle;

a bag supporting member;

means for attaching the bag supporting member to the handle adjacent one end of the handle;

at least a portion of the bag supporting member projecting from the handle and at least partially circumscribing a

region, said region being adapted to receive an open ended bag with a peripheral region of the bag around the opening thereof being folded over said portion of the bag supporting member;

manually operable clamping means adjacent said one end of said handle for clamping a region of the bag whereby the bag can be retained on the refuse collection device;

said handle including a tube having an end portion which includes said one end of said handle, said bag supporting

member having end portions which are received within said end portion of said tube and means for retaining said end portions of said bag supporting member within said tube; and

said clamping means including a clamping member, said refuse collection device including a fastener attaching said clamping member to said handle and projecting into said tube adjacent the end portions of the bag supporting member.

4,012,068

LITTER TONGS

Edward L. Apodaca, 11896 Lavinia Lane, North Glenn, Colo. 80233

Filed Aug. 12, 1975, Ser. No. 604,051

Int. Cl.² B25B *9/02*

U.S. Cl. 294—33 **2 Claims**

1. A unitary tong for picking up litter from a urinal by flexing the jaws thereof, comprising

a. a pair of jaws of rectangular cross-section integrally joined together at one of the ends thereof by a solid joint and extending in spaced parallelism from said joint to free terminals at the opposite ends of said jaws,

b. each of said jaws being of identical construction and of uniform rectangular cross-section up to said free terminals with a width of approximately four times its thickness to permit easy flexing and ready movement of said jaws towards each other by the application of manual pressure applied at any part and beyond the junction thereof, thereby to effect the approach of the free terminals of said jaws into close juxtaposition for grasping securely any litter therebetween, each of said jaws being of a length about sixteen times its width and normally spaced from each other a distance slightly greater than said width, and

c. the free terminal of each jaw being of the same width as the remainder thereof but beveled to a sharp edge from the outer to inner face thereof, so that the juxtaposed sharp edges of both jaws, as well as the rectangular corners at the opposite ends thereof, are adapted to reliably grasp all types of litter therebetween.

4,012,069

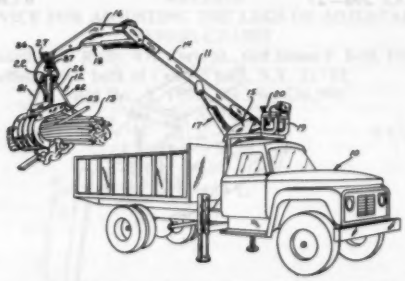
LOADING APPARATUS

William S. Carson, 218 Escambia Drive, Winter Haven, Fla. 33880

Filed Mar. 31, 1976, Ser. No. 672,056

Int. Cl.² B66C *3/16*

U.S. Cl. 294—70 **4 Claims**



1. A loading apparatus for picking up trash, brush, and the like comprising a lifting head adapted to be connected to a lifting boom and a bucket supported by the lifting head, the bucket including a pair of bucket jaws which are mounted for pivotal movement about a generally horizontally axis, each of the bucket jaws including

a. a pair of flat, curved end walls extending generally arcuately downwardly from said horizontal axis in a plane which extends generally perpendicularly to the horizontal axis, the end walls being spaced apart in a direction parallel to the horizontal axis and including a pair of flat side surfaces which extend parallel to said plane and curved inner and outer edges,

b. a plurality of flat, curved ribs, each of the curved ribs extending generally arcuately downwardly from said horizontal axis between the end walls in a plane which extends generally perpendicularly to said horizontal axis and including a pair of flat side surfaces which extend parallel to said plane and curved inner and outer edges, the ribs being spaced apart in a direction parallel to said horizontal axis,

c. a curved side wall secured to the outer edges of the ribs and to the outer edges of the end walls and terminating in a lower edge adjacent the lower ends of the ribs and end walls providing a clamshell edge,

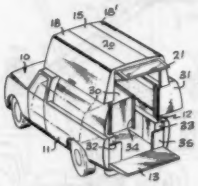
d. a tooth secured to one of the flat side surfaces of each of the ribs and extending inwardly beyond the inner edge of the rib and terminating in a trash-engaging point, the points of the teeth being generally aligned with a plane extending from the pivot axis to the clamshell edge, means connected to the lifting head and the bucket for pivoting the bucket jaws between a closed position in which the clamshell edges of the jaws are positioned adjacent each other and an open position in which the clamshell edges of the jaws are spaced apart, the teeth of each of the jaws extending generally toward the teeth of the other jaw when the bucket jaws are closed and the points of the teeth of each of the jaws being positioned adjacent the points of the teeth of the other jaw when the bucket jaws are closed, the curved inner edges of the ribs being engageable with brush and the like when the jaws move toward the closed position and the teeth being engageable with trash with the jaws move toward the closed position.

4,012,070

CONVERTIBLE CAMPER VEHICLE

Lester L. Mertz, 8529 Comanche Ave., Canoga Park, Calif. 91306

Filed July 31, 1975, Ser. No. 600,818
Int. Cl.² B60P *3/32*
U.S. Cl. 296—27 **6 Claims**



1. A self contained mobile vehicle comprising:

a body having a convertible enclosed living compartment;

a pair of berth pods defining the opposite sides of said compartment and laterally extendable on said vehicle body;

means cooperatively carried on each of said berth pods and said vehicle body for sliding said pods laterally so as to extend said pods outwardly from the opposite sides of said vehicle body;

a raisable top carried on said body having a first roadable position enclosing said berth pods with downwardly depending side panels constituting opposite vehicle body sides and top closures and a second position raised above said body to permit lateral extension of said berth pods defining an interior compartment suitable for standing and moving about therein; and

said side panels are foldable side covers pivotally carried along opposite side marginal regions of said top and deployable over the length of each of said berth pods to complete enclosure of said interior compartment when said top is in its second position; and

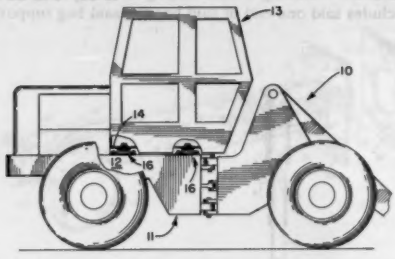
means carried on said body operably connected to said top for raising and lowering said top in either of said first and second positions.

4,012,071

CAB MOUNTING DEVICE

Gary E. Jones, Aurora; Dean H. Hart, Yorkville, and Rueben R. Brunka, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 4, 1975, Ser. No. 601,282
Int. Cl.² B62D *23/00*
U.S. Cl. 296—35 R **6 Claims**



1. Mounting means for limiting transmission of vibration imposed on a first member to a second member, the mounting means comprising:

a mounting flange mounted relative to the first member, said mounting flange having a tube-like projection extending generally upwardly of said first member and a top portion extending inwardly of said tube-like projection said top portion defining a bore generally coincident with the longitudinal axis of the tube-like projection;

an elastomeric cushioning member substantially surrounding said top portion and extending downwardly of said tube-like projection, said elastomeric cushioning member bonded to said top portion and said tube-like projection and defining an axial bore substantially aligned with the longitudinal axis of the axial bore located in said top portion;

a fastening nut bondingly associated with the elastomeric cushioning member interior of the tube-like projection;

tubular bushing means contained in the axial bore of the elastomeric cushioning member engaging the fastening nut at one end and extending upwardly therefrom in said axial bore of the elastomeric cushioning member a predetermined distance less than the depth of said axial bore of the elastomeric cushioning member, and;

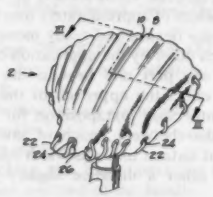
fastening means threadably engaging said fastening nut and disposed through said tubular bushing means for urging said second member toward said first member when said second member is engaged with said elastomeric cushioning member so that said elastomeric cushioning member is compressed between said second member and said fastening nut an amount determined by the length of the tubular bushing means without deformation of the tubular bushing means.

4,012,072

FLEXING MULTI-FIRMNESS SEAT COVER

Leif A. Hansen, 2000 Broadway, San Francisco, Calif. 94123

Filed Jan. 19, 1976, Ser. No. 650,568
Int. Cl.² A47C *27/00*
U.S. Cl. 297—219 **9 Claims**



1. Cover means for covering a seat of established construction, said cover means comprising; exterior surface material

means for directly engaging a user of said seat, said external surface material means being formed to include a plurality of adjacently extending raised means and groove means for providing circulation of air between said user and said exterior surface means and for flexing compressively and expansively with movements of said user to substantially reduce relative movements and friction wear between said user and said exterior surface material means, said adjacently extending raised means being separated one from another by said groove means and having substantial height with respect to said groove means, said raised means and groove means functioning to reduce relative movements between said user and said surface material means by rolling in fixed contact with said user and moving together and apart in accordian-like fashion, said cover means including fastening means for rapidly and readily removably securing said cover means to said seat.

4,012,073
THREE-POINT SAFETY BELT, MORE PARTICULARLY FOR CHILDREN

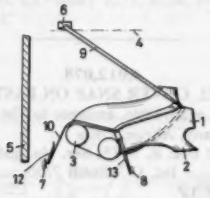
Hans-Jochim Lorenz, Hamburg, Germany, assignor to Stakupress Gesellschaft fur Stahlund Kunststoffverarbeitung mbH & Co. KG, Norderstedt, Germany

Filed Feb. 25, 1976, Ser. No. 661,310

Claims priority, application Germany, Mar. 6, 1975, 2509758

Int. Cl.² A62B *35/00*

U.S. Cl. 297—389 **6 Claims**



1. In a motor vehicle passenger safety belt with a three-point connection to the motor vehicle comprising a pelvic belt with two end parts connected to the motor vehicle for extension from opposite sides of a passenger and having fastening means for fastening the end parts together for fastening the pelvic belt across the passenger and a shoulder belt connected to the motor vehicle and to one end part of the pelvic belt extending from one side of the passenger and so as to cross in front of the passenger downwardly over a shoulder on said one side toward the other side of the passenger when the end parts of the pelvic belt are fastened together, the improvement wherein the safety belt further comprises a back belt connected at one end to the shoulder belt at the shoulder of the passenger and at its opposite end to the other end part of the pelvic belt so as to extend over at least a portion of said shoulder and cross in back of the passenger toward said other side of the passenger for firmly securing the upper body of the passenger between said shoulder and back belts while permitting full lateral upper body movement toward said other side without shoulder strap release from the passenger.

4,012,074
DEVICE FOR ADJUSTING THE LEGS OF ADJUSTABLE WHEELCHAIRS

Bernard M. O'Reilly, 470 Earle St., and James F. Best, 105 W. Suffolk Ave., both of Central Islip, N.Y. 11722

Filed Dec. 2, 1975, Ser. No. 636,922

Int. Cl.² A47C *7/50*

U.S. Cl. 297—434 **2 Claims**

1. A wheelchair including a frame, a seat mounted on said frame, a plurality of wheels, means to rotably mount said wheels on said frame, a pair of support members connected to said frame, two adjustable legs each pivotally attached to one of said support members, each of said legs comprising a bar member pivoted near its top to said support member and a foot support member attached near the opposite end of said bar member, said bar member having a rounded top portion, in combination therewith, a device for elevating and lowering said legs of said wheelchair, said device comprising a generally elongated member comprising as integral portions thereof, a first elongated portion having a free end and adapted to be

gripped and operated by the invalid using the wheelchair, a second generally elongated portion having a free end integral with said first elongated portion and formed angularly with said first elongated portion, a generally C-shaped clamping portion integral with and at the free end of said second elongated portion, said clamping portion being formed of opposite first and second side portions, a lip portion integral with and extending from one of said side portions in the same direction as said side portion, said clamping portion being adapted to exert leverage on said leg to raise said leg by fitting on its top rounded portion.

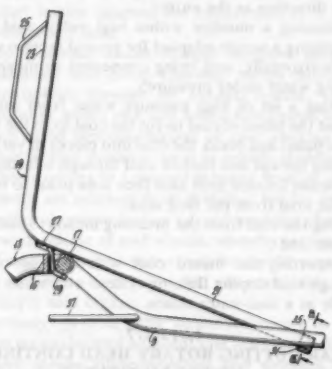
4,012,075
DEVICE FOR ADJUSTING THE LEGS OF ADJUSTABLE WHEELCHAIRS

Bernard M. O'Reilly, 470 Earle St., and James F. Best, 105 W. Suffolk Ave., both of Central Islip, N.Y. 11722

Filed Dec. 2, 1975, Ser. No. 636,991

Int. Cl.² A47C *7/50*

U.S. Cl. 297—434 **8 Claims**



1. A device for elevating and lowering the legs of a wheelchair of the type equipped with adjustable legs, which device is a generally inverted L-shaped member comprising a first elongated member having a free end and a second elongated member having a free end formed angularly with said first elongated member, means secured substantially at the juncture of the first elongated member and the second elongated member for attachment to said wheelchair adjacent each leg thereof and a cross member transversely secured at the free

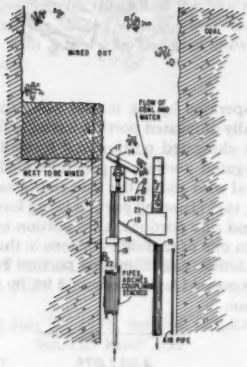
end of said first elongated member adapted for supporting either leg of the wheelchair.

4,012,076

PROCESS FOR HYDRAULICALLY MINING COAL

Kouichi Shoji, Tokyo, Japan; Ronald E. Sieling, 31 Waterhouse Ave., St. Ives, New South Wales, 2075 Australia; Joe T. Taylor, St. Ives, Australia, and Robert G. Heers, Oakland, Calif., assignors to Kaiser Resources Ltd., Vancouver, Canada; Mitsui Mining Co., Tokyo, Japan; a part interest

Division of Ser. No. 350,509, April 12, 1973, abandoned, and a continuation-in-part of Ser. No. 299,200, Oct. 20, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,625
(Filed Under Rule 47)
Claims priority, application Canada, Apr. 13, 1972, 139608
Int. Cl.[2] E21F *41/00*
U.S. Cl. 299—17 28 Claims



1. The method of hydraulically mining coal from a panel of coal of preselected average thickness comprising:

1. driving at least one entry upward through the panel to a predetermined terminus thereof at an average slope of at least about 5°;
2. installing a fluming system in said entry that slopes in the same direction as the entry;
3. positioning a monitor within said entry, said monitor comprising a nozzle adapted for pivotal motion vertically and horizontally, and being connected to means for receiving water under pressure;
4. ejecting a jet of high pressure water from said nozzle against the panel of coal to cut the coal from the face area of the panel and break the coal into pieces of varying size;
5. feeding the cut and broken coal through a further breaking means located near said face area prior to transporting the coal from the face area;
6. feeding the coal from the breaking means to said fluming system; and
7. transporting the mined coal with the aid of gravity through said sloping fluming system with water from the nozzle as a coal-water slurry.

4,012,077

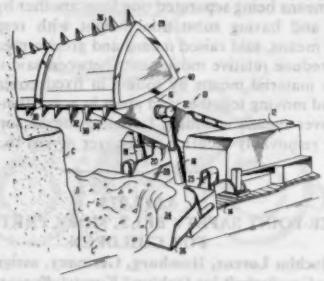
LINEAR CUTTING ROTARY HEAD CONTINUOUS MINING MACHINE

Wallace W. Roepke, Excelsior; David P. Lindroth, Apple Valley, and Joseph W. Rasmussen, Minneapolis, all of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 2, 1976, Ser. No. 702,373
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—76 10 Claims

1. A continuous mining machine for mining a horizontally extending coal vein or the like, said machine comprising:

a chassis movable longitudinally parallel to said vein
a boom carried by said chassis for pivotable movement at right angles to the direction of chassis movement,
shaft means mounted to said boom for rotation about its axis at right angles to the longitudinal axis of said boom,
means for rotating said shaft,
at least one rotary cutting head, triangular-shaped in cross



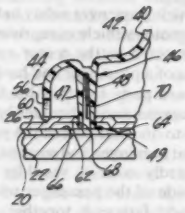
section mounted on said shaft for rotation about an elliptical eccentric path, and
longitudinally spaced cutting bits mounted on said triangular-shaped rotary head at the apices thereof;
whereby, said cutting bits follow a square cutting path during rotation of said at least one rotary head and effect linear shear and sump cuts of said coal vein during rotation thereof.

4,012,078

WHEEL COVER SNAP ON FASTENER

Dale J. Meyers, Logan, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 8, 1975, Ser. No. 638,813
Int. Cl.[2] B60B *7/00*
U.S. Cl. 301—37 TP 2 Claims



1. A removable wheel cover for a vehicle wheel having a rim and a disk fixed thereto which has a plurality of prong receiving holes in a mounting bolt hole circle area thereof with the disk arranged to provide a space having a predetermined axial dimension between the inner margin of each prong receiving hole and the surface on which a disk bears when mounted on a vehicle, and a fastener comprising; at least two prongs carried by said removable wheel cover and extending generally axially from one face thereof with the free end of each of said prongs being constructed and arranged to pass through one of the prong receiving holes, each of said prongs having a pair of generally axially extending transversely spaced apart fingers and a generally axially extending opening therein between said fingers, cam means on each of said fingers of each said prong adjacent said free end thereof and constructed and arranged to engage the inner margin of its associated prong receiving hole and urge the free end of its associated prong into firm engagement with the surface on which the disk bears when mounted on the vehicle, and a web received in said opening between a pair of fingers of each of said prongs, said web

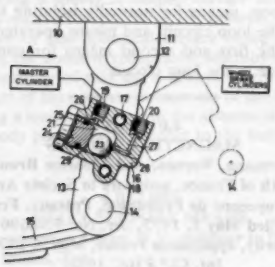
extending generally in a plane between diagonally opposed side edges of said pair of fingers and being homogeneously integral therewith, and said wheel cover, prongs, fingers, cam means, and web being a one-piece homogeneously integral body of a plastic material with said fingers and said web being resiliently flexible whereby when the free end of each of said prongs is inserted into its associated prong receiving hole, the free ends of said fingers of each pair are generally radially displaced toward each other to flex said fingers of said pair and distort their associated web so that when their associated cam means passes through said associated prong receiving hole, said flexed fingers of each pair and their associated distorted web move their associated cam means into engagement with the inner margin of said associated prong receiving hole to urge the free ends of said prongs into firm engagement with the surface on which the disk bears when mounted on a vehicle to securely and tightly releasably mount the removable wheel cover on the vehicle wheel.

4,012,079

BRAKE CONTROL APPARATUS ACTUATED BY SENSING THE DECELERATION OF A VEHICLE

Hiroshi Takeshita, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed May 20, 1975, Ser. No. 579,244
Claims priority, application Japan, May 20, 1974, 49-56361
Int. Cl.² B60T *8/22, 8/24, 8/26*
U.S. Cl. 303—6 C **4 Claims**



1. In a vehicle having a frame member and a movable spring suspension member, wheel brake cylinders and a master cylinder, and a fluid passage connecting said wheel brake cylinders to said master cylinder, the improvement, which includes a brake control apparatus actuated by sensing the deceleration of said vehicle consisting of:

a single arm member swingably secured directly upon said frame member at one end thereof and swingably secured directly upon said movable spring suspension member at the other end thereof for directly interconnecting said frame and spring suspension members;

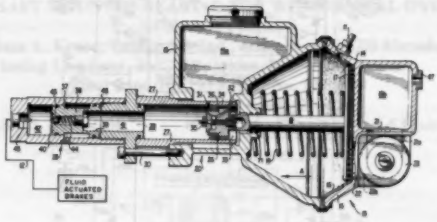
said brake control apparatus being fixedly secured upon said arm member including a main body, an inlet port fluidically communicated with said master cylinder, an outlet port fluidically communicated with said wheel brake cylinders, and a valve member interposed between said inlet and outlet ports for controlling the fluid pressure flow from said master cylinder to said wheel brake cylinders by sensing a predetermined deceleration of said vehicle, which is also dependent upon the load weight of said vehicle, when said vehicle is braked.

4,012,080

PNEUMATIC TO HYDRAULIC CONVERTER WITH INTEGRAL DUMP CHAMBER

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 417,707, Nov. 30, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,939
Int. Cl.² B60T *8/10*
U.S. Cl. 303—114 **7 Claims**



1. In combination with a braking system for a vehicle having wheels, said system having fluid actuated brakes and skid control means for detecting skidding of said wheels, a

fluid powered motor for applying and releasing said fluid applied brakes, said motor having a dump chamber selectively connectable to said motor to control skidding of said wheels during brake application in response to said control means, said motor comprising:

fluid pressure responsive motor means, said motor means comprising a housing which defines a working chamber having at least one movable wall, said motor being responsive to the admission of pressurized fluid to drive said movable wall to expand said working chamber and apply said brakes with a force proportional to the pressure in said working chamber;

conduit means adapted for connection to a source of pressurized fluid;

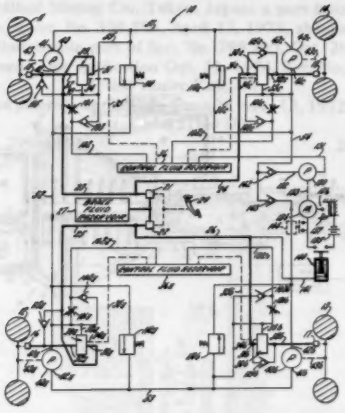
dump chamber means located adjacent said working chamber, said dump chamber means being open to atmosphere through an exhaust orifice, said dump chamber means and said orifice being sized for permitting rapid depressurization of said working chamber from a first pressure level at which skidding of said wheels occurs to a second pressure level at which said wheels are released from skidding; but for minimizing further depressurization of said working chamber following release of said wheels, whereby repressurization of said working chamber may be rapidly accomplished to a pressure level below that where skidding occurs to reapply said brakes; and

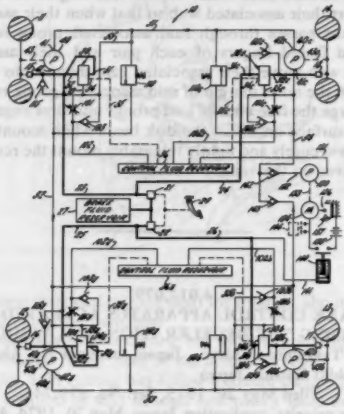
selectively operable valve means responsive to said control means located adjacent said working chamber, said valve means interconnecting said working chamber, said conduit means and said dump chamber means, said valve means serving in one position thereof to admit pressurized fluid from said conduit means to said working chamber while closing communication between said working chamber and said dump chamber means; and in another position thereof to admit pressurized fluid from said working chamber to said dump chamber means while simultaneously maintaining pressurized fluid in said conduit means.

4,012,081
VALVE AND RESPONSIVE CIRCUIT FOR ANTI-SKID HYDRAULIC BRAKING SYSTEM

Richard A. Doversberger, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Oct. 22, 1975, Ser. No. 624,984
Int. Cl.² B60T *8/04*
U.S. Cl. 303—115 **14 Claims**





3. In an hydraulic braking braking system for a vehicle having wheel brakes employing respective wheel cylinders, means including pressure lines and a pedal-controlled source of pressurized brake fluid for applying fluid to the wheel cylinders in proportion to the pressure exerted on the pedal for braking the vehicle to a stop, means coupled to each wheel for generating a control signal in response to a relatively slipping condition of incipient skid and which varies in accordance with the degree of slip, brake release valve means interposed in the associated brake line and having a piston responsive to the control signal for isolating the release valve means and associated wheel cylinder from the master cylinder during the initial portion of piston movement, the piston defining a cavity of variable size communicating with the wheel cylinder for sequentially relieving the pressure of the brake fluid applied to the wheel cylinder, the piston having a biasing spring for normally minimizing the size of the cavity but for permitting the cavity to vary in size on a continuous modulated basis in accordance with the control signal thereby to prevent the wheel from going into a full skidding condition, and check valves respectively connected from the wheel cylinders to the source bypassing the brake release valve means and faced for return of fluid to the source for insuring immediate release of pressure at the wheel cylinders upon release of pressure at the source notwithstanding the isolating effect of the brake release valve means.

4,012,082
CONTROL CIRCUIT FOR ANTI-SKID HYDRAULIC BRAKING SYSTEM

Richard A. Doversberger, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

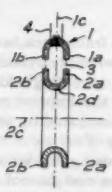
Filed Oct. 22, 1975, Ser. No. 624,715
Int. Cl.² B60T *8/087*
U.S. Cl. 303—116 **21 Claims**

1. In an hydraulic braking system for a vehicle having wheel brakes employing respective wheel cylinders, means including a master cylinder and brake pedal for applying brake fluid to the wheel cylinders in proportion to the pressure exerted on the pedal for braking the vehicle to a stop, a positive displacement hydraulic pump coupled to each wheel, each pump having an input connection and an output connection, the pumps being connected in a series loop circuit charged with control fluid so that control fluid circulates idly at low pressure in the loop as long as the wheels rotate at the same speed but with back pressure being developed at the input connection of a pump associated with a wheel which is in a relatively slipping condition of incipient skid by reason of the excess control fluid fed thereto, brake release valve means responsive to the back pressure of control fluid for correspondingly relieving the pressure of the brake fluid applied to the associated wheel cylinder thereby to prevent the wheel from going into a full skidding condition, an auxiliary source of pressurized control fluid, first means responsive to deceleration of the vehicle, second means responsive to lack of flow of control fluid in the loop, means for normally isolating the auxiliary source from the loop circuit, and means operated upon joint response of the first and second means for connecting the auxiliary source to the loop circuit.

4,012,083
MAGNETIC BEARINGS

Helmut Habermann, Vernon, and Maurice Brunet, Foret de Vernon, both of France, assignors to Societe Anonyme dite: Societe Europeenne de Propulsion, Puteaux, France

Filed May 5, 1975, Ser. No. 574,690
Claims priority, application France, May 9, 1974, 74.16080
Int. Cl.² F16C *39/00*
U.S. Cl. 308—10 **2 Claims**



1. A device including a rotor rotatable about an axis and an active magnetic bearing magnetically supporting said rotor for rotation, said magnetic bearing having a stator defining an electromagnetic circuit including at least one electromagnet which, when energized, has a pair of fixed north and south poles, said electromagnet having a U-shaped cross section in a plane including said axis of rotation of the rotor and opening towards said axis of rotation, the parallel extending side portions of said electromagnet forming respectively said fixed north and south poles and being separated by a plane of symmetry which lies perpendicular to said axis of rotation;

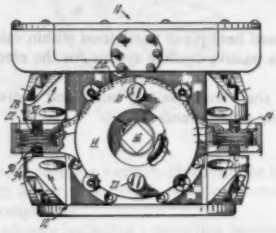
said rotor having a circumference in the shape of an annulus whose cross section is in the shape of a U, the legs of which radially aligned to face said side portions of said electromagnet.

4,012,084

SELF-ALIGNING LOAD TRANSMISSION POST

Donald H. Ranheim, Jr., East Hartford, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Filed Jan. 28, 1975, Ser. No. 544,860
Int. Cl.² F16C *7/00, 9/00, 11/00*
U.S. Cl. 308—2 R **6 Claims**



1. A self-aligning post for transmitting a load to a bellows including:

a cylindrical body portion having a planar end surface substantially perpendicular to the axis of said cylindrical body portion; and

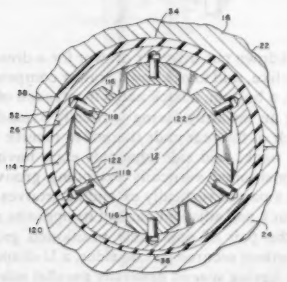
a semispherical tip, said tip having a flat surface perpendicular to the central axis of said tip and in contact with said planar surface of said cylindrical body portion, said tip also having a spherical shaped surface for engagement with a concave receptacle of the bellows, the radius of curvature of said spherical surface being less than the radius of the concave receptacle, whereby said spherical shaped surface of said tip is always in contact with the same part of the concave receptacle of the bellows when imposing a load, regardless of the alignment of said cylindrical body portion with respect to the bellows.

4,012,085

SHAFT SUPPORT MEANS

Fred Kurt Kunderman, Olean, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 16, 1975, Ser. No. 623,203
Int. Cl.² F16C *27/00, 35/00*
U.S. Cl. 308—26 **5 Claims**



1. Improved shaft support means for turbo-machines or the like having a generally horizontally oriented rotor and shaft assembly journaled in a housing, said support means comprising:

a bore in said housing;

a groove in said housing in said bore, said groove being of less depth adjacent the lower portion of said bore;

bearing means located in said bore and encircling said shafts; and,

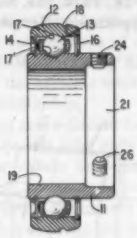
a toroidal member of resilient material encircling said bearing means and located in said groove in resilient supporting engagement with said bearing means whereby the lesser depth of said groove causes said member to exert a greater upward force on said bearing to compensate for the weight of said rotor and shaft assembly.

4,012,086

SHAFT MOUNTED BEARING FOR WITHDRAWAL OVER BURRS ON SHAFT

Claus A. Kruse, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed June 16, 1975, Ser. No. 586,899
Int. Cl.² F16C *33/30;* **B25G** *3/02*
U.S. Cl. 308—236 **4 Claims**



1. In the combination with a shaft, a bearing mounted on said shaft having outer and inner race members with a raceway therebetween and anti-friction bearing members in said raceway, said inner race member having an integral locking portion axially displaced from said raceway and with at least one radially extending threaded bore in said locking portion, a set screw threadably maintained in said threaded bore for radial threaded movement into said shaft at a point coextensive with said threaded bore to impinge upon and lock into said shaft and raise a burr thereon extending radially toward said bore and normally acting to impede separation of said shaft and said bearing when said set screw is retracted, the improvement comprising means in said inner race member for avoiding said burr impediment from preventing said separation of shaft and bearing, said means comprising a circumferential relief bore extending inside said locking portion over the entire 360° thereof and opening from the outer axial end of said locking portion, said relief bore having an axial width greater than the dimension of said threaded bore from said outer axial end of said locking portion and a radial height from said shaft greater than the height of any burr raised on the shaft by said set screw, whereby upon retraction of said set screw from a locking position on the shaft, said shaft and said bearing may be separated in an axial direction away from a burr on said shaft.

4,012,087

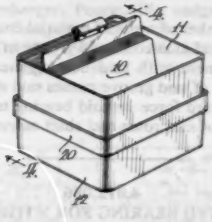
CARD INDEX BOX

Robert L. Edwards, Jr., 388 St. Mary's Parkway, Buffalo Grove, Ill. 60090

Filed July 21, 1975, Ser. No. 597,346
Int. Cl.² A47B *63/00;* **B65D** *1/34*
U.S. Cl. 312—183 **5 Claims**

1. A card file case for containing separator cards and index cards therein comprising a one piece, generally rectangular receptacle including front and back verticle walls and means for retaining said cards in an angular position from the verti-

cle, which means comprise inwardly angled projecting walls at the front and back of the receptacle which are an integral part



of the receptacle, said projecting walls being formed by angled recesses in said front and back verticle walls.

4,012,088

MONITORING AND CONTROL ARRANGEMENT

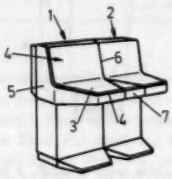
Winfried Platz, Rathsberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 28, 1974, Ser. No. 484,464

Claims priority, application Germany, Sept. 19, 1973, 2347179

Int. Cl.² A47B *47/00, 77/00*

U.S. Cl. 312—198 **4 Claims**



1. In a monitoring and control arrangement including a plurality of control desks supporting control, measuring and monitoring elements, each of said desks having a substantially horizontally positioned control surface, and said desks being constructed so as to be selectively arranged in an extended position or curved about a working location, the improvement comprising; each said control desk forming an independent component, said horizontal control surface of each said desk being a generally regularly-shaped trapezoid, the smaller of the parallel sides of said trapezoid forming the forward end edge of said control desk facing towards the operating personnel for said arrangement; generally triangular spaces being formed between adjacent horizontal control surfaces of said control desks in the extended positioning of the latter; and triangularly-shaped cover members positioned in said spaces, said cover members having upper surfaces substantially coplanar with said horizontal control surfaces so as to form a continuous control surfaces for said arrangement.

4,012,089

ELECTRONIC EQUIPMENT ENCLOSURE

Clyde L. Ward, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1974, Ser. No. 459,139

Int. Cl.² B21D *39/00*; A47B *77/08*

U.S. Cl. 312—236 **3 Claims**

1. An electronic instrument enclosure comprising:

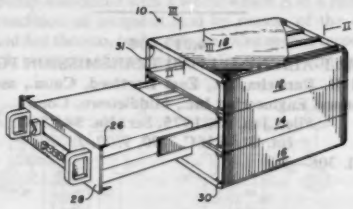
molded outer and inner spaced independent shells having walls, each shell having a common front opening;

a drawer for supporting an electronic package positionable within said opening;

a filler material having structural dampening properties intermediately positioned in the spaces between said walls of the outer and inner shells forming an integral sandwiched construction;

said outer shell constructed of a hard, impact-resistant plastic material;

the inner surfaces of the outer shell having formed therein recesses;



self-contained heat pipes positioned within said recesses to provide a passive cooling system for the electronic package;

said inner shell walls having imbedded therein hardware supporting components.

4,012,090

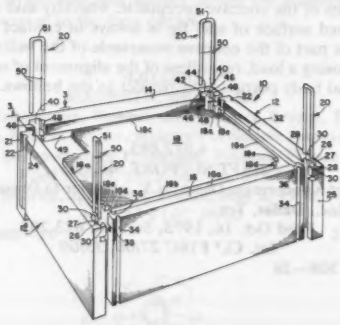
KNOCKDOWN PUT-TOGETHER DRAWER

Raymond Pfeifer, 5530 S. Lake Shore Drive, Chicago, Ill. 60616, and Roger Ringger, 7480 SW. Fifth St., Plantation, Fla. 33314

Filed Nov. 5, 1975, Ser. No. 629,145

Int. Cl.² A47B *47/04*; B65D *9/34*

U.S. Cl. 312—330 R **4 Claims**



1. A knockdown put-together drawer for a dresser, cabinet, desk and the like, said knockdown drawer comprising a pair of spaced sides, a bottom, a back and a front, each of said spaced sides having an inwardly facing vertically extending channel adjacent each of the rear ends thereof to receive the opposite ends of the back, said side channels each having a pair of oppositely positioned vertically extending grooves and said back having a pair of vertically extending grooves one on each side of the back and adjacent each of its opposite ends cooperating with the pair of oppositely positioned grooves in the sides, said bottom secured to said sides, a U-shaped interlocking member having spaced generally parallel sides and a connecting end portion with said spaced parallel sides of said interlocking member insertable in said side and back grooves through the open bottom thereof to engage said cooperating grooves to interlock said parts together, with said connecting end portion engaging the bottom of said back member to limit the insertion of said U-shaped interlocking member.

4,012,091
VACUUM CLEANER WITH REPLACEABLE ELECTRICAL TERMINALS

George Alfred Westergren, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 7, 1975, Ser. No. 629,844
Int. Cl.[2] H01R 3/04
U.S. Cl. 339—15 14 Claims

1. In a current-carrying vacuum cleaner hose having an end provided with a pair of exposed electrical contacts, the improvement comprising:

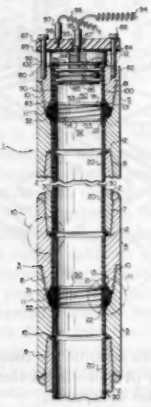
a terminal adaptor including a mounting member, and a pair of double-ended electrical terminals carried by said mounting member having a first end engaging said hose and electrical contacts, and an exposed opposite end; and

means for releasably retaining said adaptor adjacent said hose end with the first end of said terminals in electrical contact with said hose end contacts, said adaptor being arranged to permit an electrical connector to be removably connected to the opposite exposed end of said terminals.

4,012,092
ELECTRICAL TWO-WAY TRANSMISSION SYSTEM FOR TUBULAR FLUID CONDUCTORS AND METHOD OF CONSTRUCTION

Josiah J. Godbey, 812 Nottingham Drive, Richardson, Tex. 75080

Filed Mar. 29, 1976, Ser. No. 671,245
Int. Cl.[2] H01R 3/04
U.S. Cl. 339—16 R 21 Claims



1. A method of constructing an electrical coaxial conductor assembly to provide an electrical transmission system for a tubular fluid conductor composed of electrically conductive pipe and means externally connecting the adjacent ends of adjacent lengths of pipe in spaced relationship which comprises

utilizing the pipe and external connecting means as an outer electrical conductor for the coaxial conductor assembly,

forming an inner electrical conductor for said coaxial conductor assembly of thin ductile electrically conductive tubes having less diameter and slightly greater length than the interior of said pipe of the outer electrical conductor,

snugly enveloping the exterior of each tube of the inner electrical conductor in elastic dielectric material,

positioning each enveloped tube within each pipe of said outer electrical conductor,

flaring the end portions of each tube into contiguous conformity with the interior of each pipe and over the transverse faces of its ends so as to prevent relative longitudinal displacement therebetween,

deforming each tube radially outward between its flared end portions into contiguous conformity with the interior of each pipe,

the elasticity of the enveloping dielectric material permitting expansion thereof into sealing engagement with each pipe upon said flaring and outward radial deformation of each tube so as to electrically insulate each pipe from each tube throughout the length of said material,

the adjacent flared end portions of adjacent tubes of said inner electrical conductor being spaced from each other upon coupling of the adjacent ends of adjacent lengths of pipe in spaced relationship,

electrically insulating said adjacent end portions of coupled pipe from said adjacent tube ends by positioning elastic dielectric annular means between and in engagement with said tube ends for deformation into sealing engagement with the contiguous surfaces of said tube and pipe ends upon coupling of said pipe, and

electrically connecting adjacent flared tube ends by embedding electrical contact means in the inner peripheral portions of the elastic dielectric annular means.

11. In a tubular fluid conductor composed of electrically conductive pipe and means externally connecting the adjacent ends of adjacent lengths of pipe in spaced relationship, an electrical transmission system including

coaxial electrical conductor means having inner and outer tubular electrical conductors,

the outer electrical conductor being composed of the pipe and external connecting means,

the inner electrical conductor comprising tubes of electrically conductive material mounted in and complementary to each pipe of the outer electrical conductor,

a sheath of dielectric material complementary to and enveloping each tube of the inner electrical conductor for electrically insulating the exterior of said tube from each pipe of said outer electrical conductor,

each inner conductor tube and its sheath being of slightly greater length than the interior of each outer conductor pipe whereby the extremities of said tube and sheath project slightly beyond the ends of said pipe,

said projecting extremities of each inner conductor tube and its sheath being flared over the transverse faces of the ends of each outer conductor pipe so as to anchor said tube and sheath against longitudinal displacement relative to said pipe,

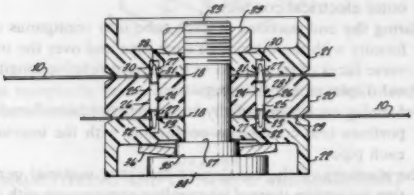
an annular body of elastic dielectric material adapted to be mounted between the adjacent ends of adjacent pipe so as to be engaged and deformed by said adjacent pipe ends into fluid-tight sealing engagement therewith as well as with adjacent flared extremities of said tubes and sheaths, and

resilient electrical contact means embedded in the inner peripheral portion of each annular elastic dielectric body and having portions exposed for engagement with said adjacent flared extremities of said adjacent inner conductor tubes.

4,012,093
CONNECTOR ARRANGEMENT FOR THIN, DEFLECTABLE CONDUCTORS

Merlin L. Crane, Banning, assignor to The Deutsch Company Electronic Components Division, Banning, Calif.

Filed Aug. 25, 1971, Ser. No. 174,696
Int. Cl.² H05K 1/02
U.S. Cl. 339—17 F 16 Claims



1. In combination with a printed circuit tape, said tape including flexible sheet means of dielectric material, and a plurality of relatively thin flat spaced electrical conductors secured to and carried by said sheet means, said conductors having openings therethrough, said openings being arranged in a circular pattern, a device for forming an electrical connection with said tape comprising

a first element of substantially rigid dielectric material,

a second element of substantially rigid dielectric material,

a plurality of spaced pins of electrically conductive material carried by said second element,

said pins having tapered portions projecting outwardly from a surface of said second element,

said pins being arranged in a circular pattern concentric with said pattern of said openings,

said tapered portions being received in said openings in said conductors and deflecting said conductors outwardly along the surfaces of said tapered portions for forming electrical connections therewith,

said first element having apertures receiving said tapered portions of said pins and said deflected portions of said conductors,

means for rotationally indexing said tape relative to said pins,

and means relatively urging said first element against said surface of said second element for gripping said conductors between said surface of said second element and the peripheries of said apertures in said first element,

said peripheries of said apertures in said first element closely circumscribing said tapered portions for providing only limited portions of said conductors for deflection by said tapered portions.

4,012,094
ELECTRON TUBE SOCKET HAVING SPRING-WIRE CONTACTS

Marinus VanRenssen, Leola, and Myron Henry Wardell, Jr., Lititz, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed June 13, 1974, Ser. No. 479,138
Int. Cl.² H05K 1/12
U.S. Cl. 339—17 D 1 Claim

1. An electron-tube socket comprising

A. a cap having a cavity therein for receiving a tube base including a plurality of pins in a circular array about an axis,

B. a wire holder adjacent said cap,

C. a plurality of spring wires having a round cross-section arranged in a circular array about said axis, each spring wire including

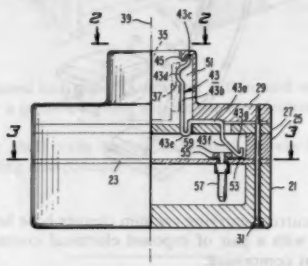
i. a single base portion clamped in a fixed position between said cap and said wire holder,

ii. an extended portion terminating in a free end which extends towards the open side of said cavity and including a contacting section adapted for contacting one of said pins,

iii. and a transitional portion connecting said base portion with said extended portion and adapted to urge said contacting section against said pin,

D. means for clamping said cap and said holder together, and

E. means within said cap for limiting the travel of said free end of each wire,



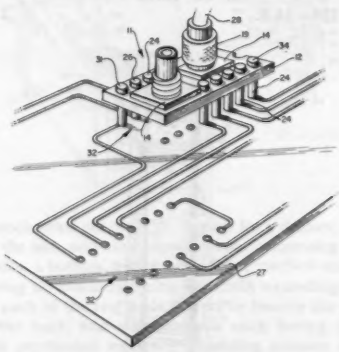
said cap having longitudinally-extending recesses in the walls of said cavity adapted to maintain the extended portions of said wires in alignment,

said socket containing a circuit board therein and at least some of said spring wires include also an auxiliary portion connected to said base portion and having a free end extending away from said open side of said cavity, said auxiliary portion being adapted to make spring contact to said circuit board contained in said socket.

4,012,095
COAXIAL INTERFACE ADAPTOR HAVING DUAL-IN-LINE CONFIGURATION

Leonard A. Doucet, Norton, Mass., and Richard M. Grubb, Cumberland, R.I., assignors to Augat, Inc., Attleboro, Mass.

Filed Oct. 2, 1975, Ser. No. 618,785
Int. Cl.² H05K 1/00
U.S. Cl. 339—17 C 15 Claims



1. A coaxial interface adaptor for coupling a coaxial cable to a dual-in-line array of holes in an electronic interconnection board, said adaptor comprising:

a substantially flat rectangular substrate having spaced parallel rows of a plurality of regularly spaced holes adjacent to the opposite long edges thereof, at least one coaxial connector location being defined by a plurality of ground post holes through said substrate and having a signal pin hole therethrough within the confines of said coaxial connector location;

a layer of electrically conductive material substantially covering a first side of said substrate, said layer having electrically separate coplanar ground conductor and signal conductor areas;

a coaxial connector mounted to the second side of said substrate, said connector having a plurality of ground posts extending through said ground post holes in said substrate and a signal pin extending through said signal pin hole, said ground posts being connected electrically to said ground conductor and said signal pin being electrically connected to said signal conductor; and

a contact pin mounted in each of at least some of said holes adjacent the opposite edges of said substrate, said contact pins extending from said first side of said substrate, said adaptor thereby having a dual-in-line configuration.

4,012,096

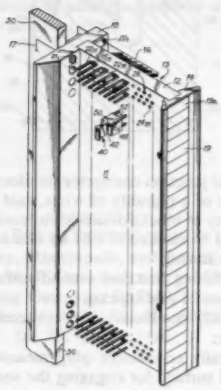
TELEPHONE CONNECTOR BLOCK APPARATUS

Paul V. DeLuca, Port Washington, and William V. Carney, Valley Stream, both of N.Y., assignors to Porta Systems Corporation, Syosset, N.Y.

Continuation of Ser. No. 410,449, Oct. 29, 1973, abandoned. This application June 4, 1975, Ser. No. 583,781

Int. Cl.² H01R *9/00, 31/08*

U.S. Cl. 339—18 R **22 Claims**



1. In combination in a connector block, a connector block body member, a plurality of interconnection stations on said block, each of said interconnection stations comprising a pair of pins secured transverse to said body member in said body member, said pair of pins projecting beyond one side of said body member, conductors on both sides of said body member attached to selected ones of said pair of pins, said conductors being directed to locations spaced from said connector block, at least one of said pair of pins projecting beyond the other side of said body member, test pin members secured within said connector block body member, each of said test pin members being associated with only one of said interconnection stations for enabling selective testing of said interconnection stations, test connection means for electrically connecting selected ones of said pair of pins at said interconnection station to selected ones of said test pin members, at least one plug connector member including at least two recesses therein and electrical conductor means disposed within said recesses for selectively electrically interconnecting said pair of pins at said interconnection station, and said recesses receiving said pair of pins in detachable mating relationship.

4,012,097

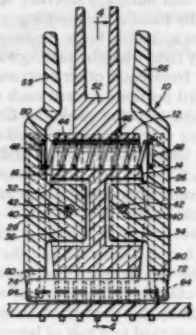
COMBINED TEST CLIP AND COMPONENT EXTRACTION TOOL

Walter J. Long, Upland; Lawrence E. Wysocki, Covina, and George M. Wohlhieter, Upland, all of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Filed Oct. 17, 1975, Ser. No. 623,332

Int. Cl.² H01R *13/62*

U.S. Cl. 339—45 M **13 Claims**



1. A combined test clip and electronic component extraction tool comprising:

a. a main body including opposite ends, opposite sides, a top and a bottom;

b. a pair of upstanding levers pivotally secured intermediate their upper and lower end portions to opposite ends of the body for limited oscillation about an axis transverse to the sides of the main body;

c. means for yieldingly biasing the upper ends of the levers apart;

d. a plurality of elongated upstanding longitudinally spaced conductive side contacts insulated from each other and supported by and projecting downwardly from each side of the main body; and

f. a pair of upstanding, opposing, conductive contacts depending from each lever, each lever-depending contact having an exposed upper and lower end, the lower end of each lever-depending contact comprising conductive hooks opening inwardly toward the opposing lever.

4,012,098

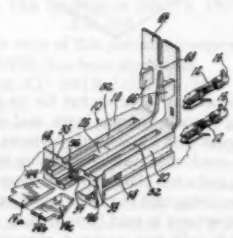
ELECTRICAL CONNECTOR

Emil J. Tolnar, Jr., Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 2, 1976, Ser. No. 702,216

Int. Cl.² H01R *13/54*

U.S. Cl. 339—61 R **3 Claims**



1. A unitary connector body of molded dielectric material for connection to a pair of laterally spaced electrical terminals each having a latch shoulder extending laterally in a direction away from the other terminal comprising:

a first elongated hollow member for housing an electrical terminal matable with one of said first mentioned terminals and a second elongated hollow member for housing an electrical terminal matable with another of said first mentioned terminals, said members each having a forward portion for receiving one of said first mentioned terminals, an intermediate portion and a rearward portion,

bridge means interconnecting the intermediate portions of said members and normally laterally spacing said members in generally parallel relationship,

said bridge means including hinge means and said members being relatively rigid whereby said forward portions move laterally away from each other responsive to movement of said rearward portions toward each other,

said forward portions being generally C-shaped in lateral section defining side openings toward the bridge means for permitting lateral movement of said forward portions away from each other when a pair of laterally spaced terminals in fixed spatial relationship are disposed in said forward portions, and

each of said forward portions having a rearwardly facing shoulder which is at a forward end thereof and opposite its side opening for locking engagement with respective laterally projecting latch shoulders of a pair of electrical terminals whereby the connector body is adapted to be detachably connected to a pair of laterally spaced electrical terminals in fixed spatial relationship.

4,012,099

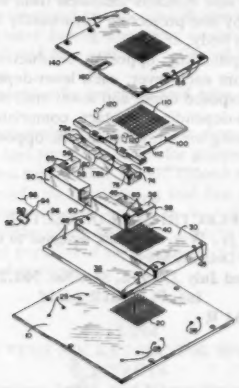
ZERO INSERTION FORCE SOCKET

John L. Worcester, Walnut Creek, Calif., assignor to E-H Research Laboratories, Inc., Oakland, Calif.

Filed May 1, 1975, Ser. No. 573,625

Int. Cl.² H01R *13/54*

U.S. Cl. 339—75 M **3 Claims**



1. In a zero insertion force socket for an active electrical device having a plurality of pin leads said socket including bottom plate means with a matrix of apertures through each of which passes a conductor lead terminating in a two pronged connector jack, and a top plate with a corresponding matrix of apertures for receiving said pin leads and juxtaposed opposite said matrix of apertures in said bottom plate means into each of which extends said two pronged connector jack, and a slidable middle plate positioned between said bottom plate means and said top plate with a matrix of apertures correspondingly juxtaposed between said matrices of apertures of said bottom plate and said top plate, each of said jacks being located in a respective aperture of said middle plate and where movement of said slidable middle plate causes each of said two pronged connector jacks to make physical contact and electrical connection with a pin lead inserted through an aperture in said top plate into said jack, the improvement comprising: said top plate and said bottom plate means consisting of electrically conductive material for electromagnetically shielding said conductors and associated connector jacks from each other and said slidable middle plate consisting of insulating material and together with a plurality of tubular conductors having one end affixed to each aperture of said bottom plate means and with said respective conductor leads which terminate in said jacks extending coaxially therethrough, said tubular conductors diverging into the half space defined by said bottom plate means and on the opposite side of said bottom plate means as said top plate, the other end of each of said tubular conductors terminating in a predetermined one of a plurality of planes substantially parallel to said bottom plate means.

4,012,100

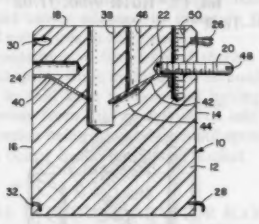
ELECTRICAL JUNCTION CONNECTOR MODULE

Armando J. Viscosi, 1360 E. 95th St., Brooklyn, N.Y. 11236

Filed Nov. 20, 1975, Ser. No. 633,626

Int. Cl.² H01R *9/12*

U.S. Cl. 339—95 D **5 Claims**



1. An electrical junction connector for electrically interconnecting the ends of a plurality of wires, said connector comprising: a plurality of blocks of dielectric material; said blocks being adapted to be stacked in side by side adjacent relationship; each block having:

a. oppositely facing first and second surfaces for abutting adjacent ones of said blocks;

b. an electrically conductive socket means formed in said first surface;

c. an electrically conductive plug means extending from said second surface for engaging the socket means of an adjacent one of said blocks;

d. a third surface extending between said first and second surfaces;

e. a first bore opening on said third surface for receiving the end of one of said wires; and

f. and electrical conductor means extending within said block from said socket means and from said plug means to said first bore.

4,012,101

CIRCUIT TERMINATION DEVICE

Anthony John Damoisiaux, Basingstoke, and Raymond George Evans, Kingsclere, near Newbury, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed June 6, 1975, Ser. No. 584,277

Claims priority, application United Kingdom, July 18, 1974, 31845/74

Int. Cl.² H01R *11/20*

U.S. Cl. 339—97 C **4 Claims**

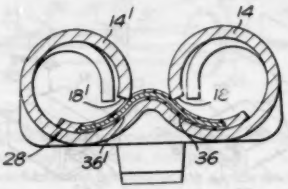
1. A termination device for a flexible circuit or printed circuit having a conductor comprising:

a metallic member of generally rectangular form having a

base and a pair of parallel, deformable sidewalls integral with said base at opposed sides thereof;

said sidewalls being turned over toward each other with their edges directed downwardly toward said base, said turned-over sidewalls being spaced from each other to define a gap therebetween;

a central elongated porition of said base projecting upwardly toward said gap, said elongated portion having concave surfaces extending along the sides thereof underlying said edges, respectively;



said edges being spaced above said elongated portion of said base a distance sufficient to allow said circuit to be inserted therebetween; and

said sidewalls being shaped so that when they are forced downwardly toward said base, said sidewalls will move in a curved path generally complementary to the curvature of said concave surfaces to grip said circuit between said sidewalls and said base and to rupture the insulation, if any, on said circuit in a scraping manner without piercing the conductor of said circuit.

4,012,102

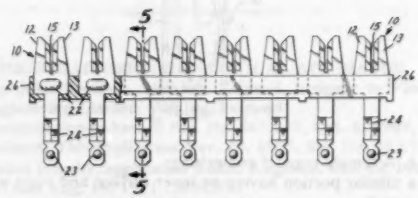
SOLDERLESS ELECTRICAL CONTACT

Thomas M. Cherney, Minneapolis, and Robert S. Dodsworth, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 26, 1976, Ser. No. 689,977

Int. Cl.² H01R *9/08*

U.S. Cl. 339—97 P **8 Claims**



1. A solderless electrical contact comprising a thin resilient flat plate having at least one pair of parallel extended legs defining an open-ended wire-receiving slot, said legs being similarly coined along said wire-receiving slot, said coining being progressively deeper into the thickness of said flat plate from the open end of said slot toward the closed end thereof to taper said slot from a width adjacent the open end of said slot of less than the thickness of said flat plate to a lesser width adjacent the closed end of said slot, whereby effective electrical connection can be made to two small diameter insulated conductors pressed into said wire-receiving slot.

4,012,103

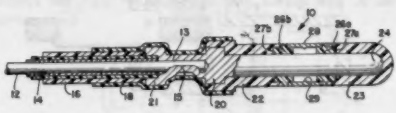
ANTISHOCK, INSULATED CONNECTOR

Frank C. Lunquist, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sept. 3, 1975, Ser. No. 610,068

Int. Cl.² H01R *13/52*

U.S. Cl. 339—111 **12 Claims**



1. An antishock electrical connector adapted for the environment of an animal body, comprising:

a. a first electrically conductive member;

b. an electrical conductor affixed to and electrically coupled to said first electrically conductive member;

c. a layer of insulating material disposed about substantially the entire surface of said first electrically conductive member;

d. a second electrically conductive member disposed over said insulating layer and adapted to make electrical contact with said first electrically conductive member; and

e. means for disposing said second electrically conductive member in a spaced relationship with said first conductive member to prevent extraneous charges applied to said second electrically conductive member from passing thereacross to said first electrically conductive member, and for providing a liquid-tight seal between said insulating layer and said second electrically conductive member to prevent the entrance of liquid into the space between said first and second electrically conductive members, said means permitting disposition of said second electrically conductive member between a first, normal position wherein said first and second electrically conductive members are spaced from each other, and a second, flexed position wherein said first and second electrically conductive members are in electrical contact with each other, thus forming an electrical circuit from said first conductive member through said second conductive member to said conductor.

4,012,104

BATTERY TERMINAL CONNECTOR AND HOUSING ASSEMBLY

Richard R. Wening, 2113 N. Eastside St., Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 405,587, Oct. 11, 1973, Pat. No. 3,867,007, which is a continuation-in-part of Ser. No. 293,334, Sept. 29, 1972, Pat. No. 3,790,920, which is a continuation-in-part of Ser. No. 154,737, June 21, 1971, Pat. No. 3,718,891. This application Feb. 10, 1975, Ser. No. 548,588

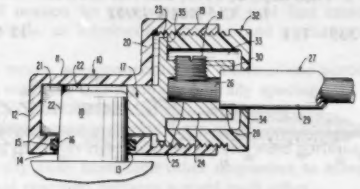
The portion of the term of this patent subsequent to Feb. 27, 1990, has been disclaimed.

Int. Cl.² H01R *13/52, 11/26*

U.S. Cl. 339—116 C **4 Claims**

1. A battery terminal connector and housing assembly comprising a split connector cap having a bore to grippingly engage a storage battery terminal post, said connector cap having an extension adapted for connection detachably with a battery cable so that such a cable can be mechanically and electrically coupled to the connector cap, a full circle flat abutment face on the connector cap projecting radially of said extension, a housing member for the connector cap substantially enclosing it and having an opening adapted to receive a battery terminal post and being in registration with said bore of the split connector cap, and a pressure sleeve having screw-threaded engagement with said housing member and sur-

rounding and substantially enclosing said extension of the connector cap and having a leading annular flat abutment face adapted to frictionally engage said full circle abutment face of



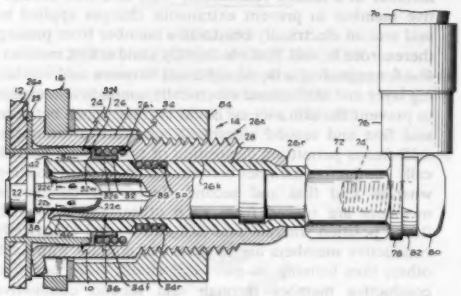
the connector cap and to exert pressure thereon with said pressure distributed evenly around the full circumferential engagement areas of the flat abutment face and said full circle abutment face.

4,012,105

COAXIAL ELECTRICAL CONNECTOR

Christopher Scott Biddle, Issaquah, Wash., assignor to Bell Industries, Inc., Los Angeles, Calif.

Filed Sept. 30, 1974, Ser. No. 510,434
Int. Cl.² H01R *17/18*
U.S. Cl. 339—177 R **9 Claims**



1. An electrical connector for receiving and making electrical contact with a plug, comprising:

an outer shell with an open forward end;

a ring-shaped contact disposed in said outer shell; and

a coil spring having a forward spring portion movably disposed in said outer shell and bearing against said ring-shaped contact to urge said contact towards said open forward end of said shell;

said coil spring having a rearward end portion; and including

means firmly pressing radially against said rearward end portion of said coil spring for fixedly holding said rearward end portion and making low resistance contact therewith.

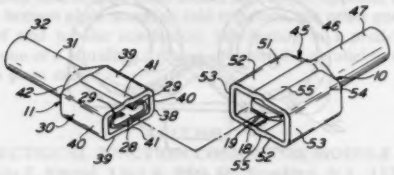
4,012,106

INSULATED TERMINAL CONSTRUCTION

John Richard Filson, Melville, N.Y., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed June 20, 1975, Ser. No. 588,608
Int. Cl.² H01R *11/22*
U.S. Cl. 339—211 **2 Claims**

1. In combination, an insulated female terminal comprising a conductor receiver female terminal barrel, a single female element extending longitudinally from said barrel terminating in an open end, and a female terminal sheath of insulating material extending about said barrel and female element; and an insulated male terminal comprising a conductor receiver male terminal barrel, a male element extending longitudinally from said male terminal barrel and terminating in a free end for mating engagement in the female element, and a male terminal sheath of insulating material extending along said male terminal barrel and spacedly surrounding said male element for encompassing said female terminal sheath when said elements are in said mating engagement, said female terminal barrel being of a diameter greater than the transverse dimension and less than the lateral dimension of said single female element, and said female terminal sheath having a barrel receiving portion and an integral female element-receiving portion, the barrel-receiving sheath portion having a diameter approximately equal to the transverse dimension of



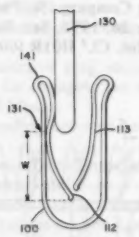
and less than the lateral dimension of said female element-receiving sheath portion, said female terminal barrel and female element being insertable into said female terminal sheath by passage of said terminal barrel through said female element-receiving sheath portion, said female terminal barrel-receiving sheath portion being generally cylindrical, and said female element sheath receiving portion being of generally flat cross-sectional configuration, opposed medial regions of said female element-receiving sheath portion being symmetrically distended to define cylindrical longitudinal extensions of said barrel-receiving sheath portion, for passage therethrough of said female terminal barrel.

4,012,107

FEMALE TERMINALS

Robert Franklin Cobaugh, Elizabethtown, and Norwood Claude Graeff, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 17, 1975, Ser. No. 641,399
Int. Cl.² H01R *13/12*
U.S. Cl. 339—258 P **11 Claims**



1. A female contact comprising:

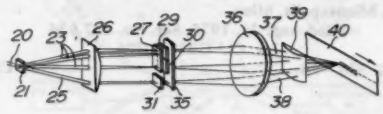
a tubular portion having an inner surface and open at one end;

at least one contact finger extending outwardly and upwardly from a given portion of the open end of said tubular portion and bent back upon itself to extend into the interior of said tubular portion downwardly and closely adjacent the section of the inner surface of said tubular portion near the said given portion of said open end thereof and then following a curved path, having a generally concave side and a generally convex side, away from said section of said inner surface and towards the other side of said tubular portion with the concave side of said curved finger facing said other side of said tubular portion.

4,012,108
HOLOGRAM MEMORY APPARATUS

Akira Ishii, Kawasaki, and Keiichi Ueno, Tokyo, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jan. 15, 1975, Ser. No. 541,303
Claims priority, application Japan, Jan. 17, 1974, 49-7509
Int. Cl.² G03H *1/30, 1/16*
U.S. Cl. 350—3.5 **14 Claims**



1. A hologram memory apparatus for recording information as one-dimensional holograms, comprising:

optical source means for producing a coherent light beam;

beam splitter means for dividing the coherent light beam into at least one signal light beam and a reference light beam;

first optical means having a common optical axis for said at least one signal light beam and said reference light beam for focusing said light beams into parallel beams, said focused reference light beam being spaced from said focused at least one signal light beam by a distance of slightly greater than L/2;

light switch means for intercepting said at least one signal light beam and controllably transmitting a plurality of linearly arrayed signal light beams corresponding to information to be recorded, said light switch means having a length L;

polarization controlling means for spatially dividing said light switch means into two L/2 regions wherein the electric vectors of the contiguous transmitted signal light beams of one region intersect the electric vectors of the contiguous transmitted signal light beams of the other region orthogonally, the electric vector of said reference light beam being at 45° to each of the electric vectors of the transmitted signal light beams from said two regions;

memory means having a surface in which said one-dimensional holograms are to be recorded; and

second optical means having a common optical axis for said transmitted signal light beams and said reference light beam for focusing said light beams on the surface of said memory means to form interference patterns, the aperatures of said first and second optical means being on the order of 3/2 L.--

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4,012,109
HIGH MAGNIFICATION OPTICAL APPARATUS

Robin John Freeman, Woking, England, assignor to Vision Engineering Limited, Woking, England

Continuation-in-part of Ser. No. 863,952, Oct. 6, 1969, abandoned. This application Nov. 29, 1971, Ser. No. 202,743
Claims priority, application United Kingdom, Dec. 12, 1968, 59137/68; Aug. 19, 1971, 38943/71
Int. Cl.² G02B *21/22*
U.S. Cl. 350—36 **6 Claims**

1. Apparatus producing an enlarged exit pupil, comprising:

a. means for positioning at said apparatus an object to be viewed;

b. objective lens means spaced from said object;

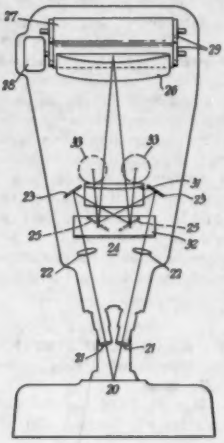
c. projection lens means spaced from said objective lens means in the optical path proceeding from said objective lens means;

d. first field lens means positioned in said optical path beyond said projection lens means;

e. a reflective lenticulated surface over which discrete lenticules are distributed positioned in said optical path beyond said first field lens means at focal plane of the image so that each lenticule reflects light incident thereon back through said first field lens means;

f. second field lens means positioned in the continuing optical path reflected from said lenticulated surface;

g. reflecting means on the side of said second field lens means opposite said lenticulated surface and oriented to reflect the light incident thereon to the eye of an observer, and

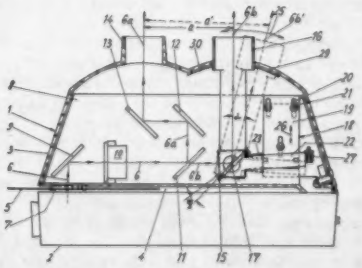


h. means to provide uniform motion of said lenticulated surface in a direction to cause the depressions of said lenticules to scan across light pencils incident thereon at a speed such that the persistence of vision and form of the said depressions of said lenticules effectively multiplies the angle of light egress from said surface of said light pencils whereby effectively to produce said enlarged exit pupil at the eye of said observer.

4,012,110
BINOCULAR OPTICAL APPARATUS WITH ADJUSTABLE INTEROCULAR DISTANCE, PARTICULARLY FOR MICROFILM VIEWERS

Rudi Schael, Kandinskystr. 27, D-8 Munich 71, and Kurt Kellner, Langburgenerstr. 2, D-8 Munich 90, both of Germany

Filed Jan. 26, 1976, Ser. No. 652,393
Claims priority, application Germany, Jan. 28, 1975, 2503419
Int. Cl.² G02B *7/12, 27/02*
U.S. Cl. 350—75 **17 Claims**



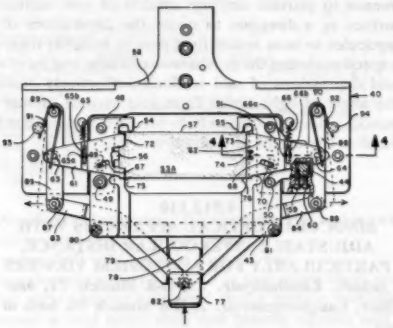
1. In a mechanism for the adjustment of interocular distance in binocular optical apparatus provided with objective and

eyepiece lens systems whereby a magnified image of an object is provided at said eyepieces, a plurality of mirrors disposed between said object and said eyepieces, wherein at least one eyepiece is movable to angularly position the optical axis of one said movable eyepiece relative to the axis of the other eyepiece for providing diverse interocular distances corresponding to variations of human eye separations, the improvement comprising a rotatable mirror disposed in the optical axis of one said movable eyepiece and means for angularly rotating said mirror at one half the angular rate of one said movable eyepiece, said means comprising a plate member linearly displaceable, a pair of levers having a common fulcrum axis, the first of said levers supporting said rotatable mirror for rotation of the reflecting surface of said mirror about said fulcrum axis, said first lever having an end attached to said plate member for displacement thereby, the second of said levers having an arm supporting one said movable eyepiece and another arm connected to said plate member such that said rotation of said eyepiece causes linear motion of said plate member and pivoting of said first lever about said fulcrum axis, said first lever and the second arm of said second lever having lengths in the ratio of 2 to 1 such that for every pivoting of said eyepiece about a predetermined angle said mirror is pivoted of one half of said angle.

4,012,111
MICROSCOPE OBJECT SLIDE POSITIONING SYSTEM

Earl E. Masterson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 25, 1975, Ser. No. 607,514
Int. Cl.² G02B 21/26
U.S. Cl. 350—90 **10 Claims**



1. An apparatus for rigidly and precisely positioning an object slide relative to a microscope stage comprising:

a stage traverse support plate to receive and support a slide carrier tray;

a slide carrier tray fixed in predetermined relation to said stage traverse plate and carried thereby, said carrier tray having a recess therein for receiving an object slide;

predetermined, fixed alignment registration means on said slide carrier tray for determining the positive alignment of a slide in said recess, said alignment registration means determining the location of the rearward directed side and one end of said slide in said recess;

retractable clamping means cooperating with said alignment registration means for urging and maintaining said slide against said alignment registration means, said slide clamping means further comprising:

a pair of oppositely disposed retaining means adapted to position said slide operating on the outward directed side and the ends of said slide to urge said slide to a predetermined position against said registration means and said recess;

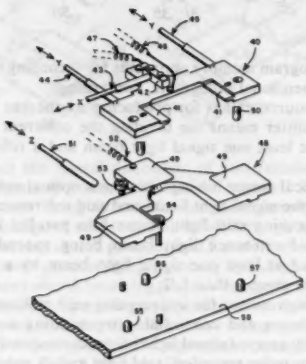
means generating a force for maintaining said retaining means against said slide; and

release means for operating on said retaining means said release means for generating forces simultaneously opposing said force for maintaining each of said retaining means said release means functioning to retract said retaining means for removing and inserting slides in said system.

4,012,112
MICROSCOPE STAGE POSITIONING SYSTEM

Earl E. Masterson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 25, 1975, Ser. No. 607,634
Int. Cl.² G02B 21/26
U.S. Cl. 350—90 **15 Claims**



1. A precision, automatically controllable microscope state positioning system, said system comprising:

a slide carrier means for carrying a mounted object slide;

a stationary stage support base member disposed beneath said slide carrier means;

a wedge-shaped member sandwiched in slidable relation between said slide carrier means and said base member, such that slide carrier means is freely slidably carried on the upper surface of said wedge-shaped member and said wedge-shaped member is slidably mounted on said base member in a manner such that the movement thereof substantially parallel to the wedge taper produces a corresponding movement of the upper surface of the wedge shaped member along the *z* axis perpendicular to the upper surface thereof,

x and *y* drive means for precisely positioning said slide carrier means in the *x*—*y* plane, said *x*—*y* plane being parallel to said surface of said wedgeshaped member, by the movement thereof along the *x* and *z* axes of said plane, said *x* and *y* drive means further comprising

independent axially adjustable, reversible pusher means operating against said slide carrier means for urging said slide carrier means in one direction along each of said *x* and said *y* axes;

resilient return means opposing said pusher means and holding said slider carrier means in continual contact therewith; and

z drive means for positioning said slide carrier means along the *z* axis, said *z* axis being perpendicular to said *x*—*y* plane, said drive means comprising independent axially adjustable, reversible pusher means operating against said wedge-shaped member for urging said wedge-shaped member in one direction parallel to said taper;

resilient return means opposing said pusher means and holding said wedgeshaped member in continual contact therewith;

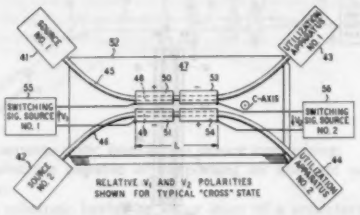
reversible actuating means for axially adjusting said pusher means; and

control means for controlling said actuating means.

4,012,113
ADJUSTABLE OPTICAL SWITCH OR MODULATOR

Herwig Werner Kogelnik, 118 Buttonwood Drive, Fair Haven, N.J. 07701, and Ronald Vernon Schmidt, 323 Arlene Terrace, Matawan, N.J. 07747

Filed Dec. 17, 1975, Ser. No. 641,649
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C 12 Claims

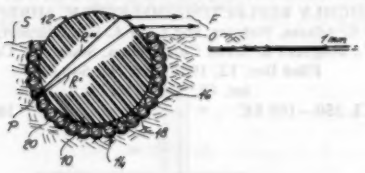


1. A switch comprising a pair of waveguides having mutually parallel portions in sufficient proximity for $\Delta\beta$-switched directional coupling therebetween, and control means comprising at least two sets of control elements disposed about said parallel portions of said waveguides and coupled sequentially thereto to define at least two asynchronous sequential coupling sections along said parallel portions, and means for supplying control signals to make the phase mismatch of opposite sign in two sequential ones of said sections to achieve a cross state.

4,012,114
HIGH EFFICIENCY REFLECTING SYSTEM, AND METHOD

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed May 19, 1975, Ser. No. 578,922
Claims priority, application Italy, May 20, 1974, 22963/74
Int. Cl.² G20B 5/22
U.S. Cl. 350—104 7 Claims

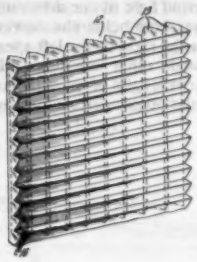


1. A retroreflecting device, comprising at least one transparent, substantially spherical element having a first refractive index such that a ray impinging said element is refracted and at least partially focused regardless of the angle of impingement; reflecting means arranged to retroreflect rays which pass through said element; and a transparent medium securing said reflecting means to and spacing said reflecting means from said element, said medium including one portion which has a second refractive index different from said first refractive index, and said medium further including another portion which extends from said one portion to said element, said other portion of said medium having a refractive index at locations adjacent said element which substantially equals said first refractive index, and said other portion of said medium having a refractive index at locations adjacent said one portion of said medium which substantially equals said second refractive index, the refractive index of said other portion of said medium varying substantially progressively from said first refractive index to said second refractive index so that said other portion of said medium acts as an optical transition zone.

4,012,115
SAWTOOTH SHAPED FRONT SCREEN

John Brown, Flemington, N.J., assignor to Qantix Corporation, Flemington, N.J.

Filed July 10, 1975, Ser. No. 594,721
Int. Cl.² G03B 21/60
U.S. Cl. 350—128 12 Claims

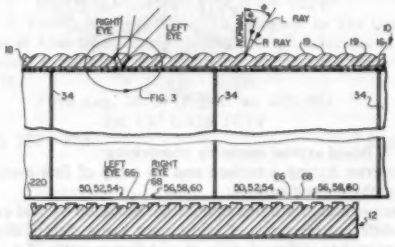


1. A front projection screen having a transparent front light receiving surface and reflecting means spaced from said transparent front light receiving surface for reflecting light incident thereon through said transparent front light receiving surface back through said transparent front light receiving surface; said front projection screen being characterized in that a plane intersecting said transparent front light receiving surface and said reflecting means intersects said reflecting means in a straight line and said transparent front light receiving surface in a line at least a portion of which is tilted with respect to said straight line.

4,012,116
NO GLASSES 3-D VIEWER

George Johannus Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Filed May 30, 1975, Ser. No. 582,170
Int. Cl.² G02B 27/26
U.S. Cl. 350—132 8 Claims



1. An apparatus for three-dimensional microfiche viewing, including,

a. a viewing screen defined by a lenticular plate having a plurality of integral, convex lenses regularly arrayed over its exterior surface and having an opaque coating on its interior surface,

b. a pair of apertures in said opaque coating associated with each convex lens and in general alignment therewith, one of each pair termed the right aperture and the other of said pair termed the left aperture,

c. said left and right aperture of each said aperture pair being spaced from each other, and each aperture pair being positioned with respect to its associated convex lens,

d. whereby light emanating from the left apertures of each pair and passing to the convex lenses is refracted and

leaves the said plate at a first angle to its plane, and whereby light emanating from the right apertures of each pair and passing to the convex lenses is refracted and leaves the said plate at a second and different angle to its plane,

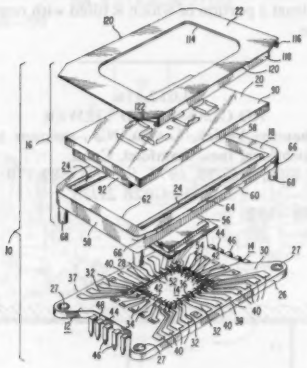
e. each left aperture of said pair having a light polarizer of one direction and each right aperture of said pair containing a light polarizer of an orthogonal direction,

f. whereby polarized light of one direction incident upon all of the apertures from below the viewing screen will pass through either the right or the left apertures of each pair but not through other apertures of each pair, and whereby polarized light of an orthogonal direction will pass through the other apertures of each pair.

4,012,117
LIQUID CRYSTAL MODULE

Angelo Gino Lazzery, Oaklyn, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,671
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **9 Claims**



1. A liquid crystal assembly comprising:

a carrier having a surface and an array of first metallized paths on said surface,

a semiconductor integrated circuit mounted on said carrier, different terminals of said circuit being electrically connected to different ones of said first metallized paths,

an apertured frame, an electrical connector mounted within said frame,

said connector comprising a body of resilient material having an oblong cross section and a plurality of conductive lines on the outside surface of said body wherein the width of said conductive lines is less than the spacing between adjacent ones of said first and second metallized paths,

a liquid crystal cell comprising a substrate in contact with a liquid crystal material and an array of second metallized paths on an exposed surface of said substrate, and

means for mounting said cell and said carrier on opposite sides of said frame with said connector clamped and resiliently deformed therebetween, such that said connector conductive lines resiliently press against each path of a different pair of said first and second metallized paths to provide an electrical connection therebetween.

4,012,118
TEXTURE TRANSFORMATIONS IN OPTICALLY NEGATIVE LIQUID CRYSTALS

James H. Becker, Denton, Tex., and Joseph J. Wysocki, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 506,141, Sept. 16, 1974, Pat. No. 3,960,439. This application Jan. 22, 1976, Ser. No. 651,307
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **3 Claims**

1. A method for transforming an optically negative liquid crystalline composition from the Grandjean texture state to the focal-conic texture state and back to the Grandjean texture state, comprising the steps of:

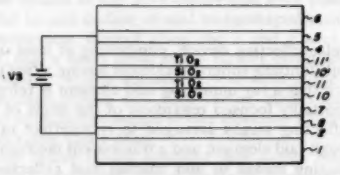
a. providing between a pair of non-injecting electrodes, at least one of which is transparent, a layer of an optically negative liquid crystalline composition in the Grandjean texture state comprising an optically negative liquid crystalline material and an additive, said additive comprising a material selected from the group consisting of electrophoretic materials, dielectrophoretic materials, dipolar materials and mixtures thereof; and

b. transforming said composition into the focal-conic texture state and then into the Grandjean texture state by applying a D.C. electrical field between said two electrodes and without changing the magnitude of said applied D.C. electrical field.

4,012,119
DIRECT CURRENT LIQUID CRYSTAL DISPLAY WITH HIGHLY REFLECTING DIELECTRIC MIRROR

James E. Adams, Webster, and Gary A. Dir, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,081
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **10 Claims**

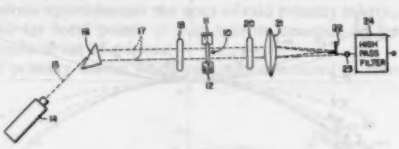


1. A liquid crystal display for reflection viewing of a direct current electro-optic change in a liquid crystal layer by a reflection bandwidth having a center wavelength, λ, comprising: between two electrodes a layer of liquid crystalline composition in contact with a dielectric mirror; said dielectric mirror having a thickness effective for conducting direct current and comprising at least one pair of titanium dioxide and silicon dioxide layers, each layer having an optical thickness of $nt=[(m+1)/4]\lambda$ where n is the index of refraction, t is the layer thickness and m is selected from the group consisting of 0 and positive whole numbers; said layer of titanium dioxide being in contact with said layer of liquid crystalline composition.

4,012,120
GUIDED WAVE ACOUSTO-OPTIC DEVICE

Reynold S. Kagiwada, Los Angeles, and David B. Hall, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed May 14, 1975, Ser. No. 577,266
Int. Cl.² H03H 9/26, 9/32; G02F 1/11; G06F 7/56
U.S. Cl. 350—161 W 9 Claims

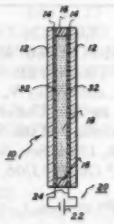


7. An acousto-optic interaction device comprising:
a. a substrate capable of supporting an acoustic surface wave;
b. said substrate having an outer layer of a predetermined thickness and of a higher optical index of refraction than that of the bulk of said substrate for guiding an optical beam therethrough;
c. a first interdigital tranducer disposed on said substrate at one end thereof;
d. a second interdigital transducer disposed on the other end of said substrate, whereby said transducers are capable of launching two acoustic surface waves travelling in opposite directions for interaction with a light beam passing through said surface layer;
e. means for impressing a received signal on one of said transducers; and
f. additional means for impressing a stored signal on the other one of said transducers.

4,012,121
TEXTURE TRANSFORMATIONS IN OPTICALLY NEGATIVE LIQUID CRYSTALS

James H. Becker, Denton, Tex., and Joseph J. Wysocki, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 506,141, Sept. 16, 1974, Pat. No. 3,960,439. This application Jan. 22, 1976, Ser. No. 651,302
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 2 Claims

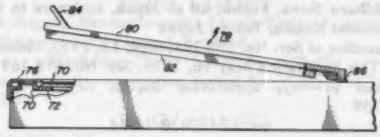


1. A method for providing a display comprising the steps of:
a. providing a layer of an optically negative liquid crystalline composition between a pair of non-injecting electrodes at least one of which is transparent, wherein said composition comprises optically negative liquid crystalline material and an additive, said additive comprising a material selected from the group consisting of electrophoretic materials, dielectrophoretic materials, dipolar materials and mixtures thereof, and providing said composition in the Grandjean texture state;
b. applying a first D.C. electrical field pulse across said layer sufficient to cause said composition to be transformed to the focal-conic texture and terminating said pulse as the current through said composition becomes substantially zero; and
c. applying a second D.C. electrical field pulse across said layer of the same polarity and magnitude as said first D.C. electrical field pulse, said second D.C. electrical field pulse having a duration sufficient to transform said composition to the Grandjean texture state.

4,012,122
LIQUID CRYSTALLINE PLATEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

James H. McVeigh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 456,089, March 29, 1974, Pat. No. 3,936,172. This application Apr. 28, 1975, Ser. No. 572,030
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 6 Claims

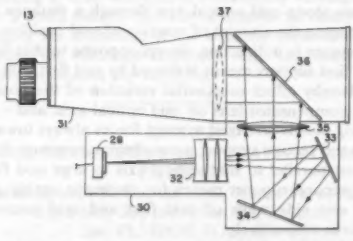


1. An apparatus for housing a substantially opaque document having indicia on one surface thereof, including:
a normally transparent support member having the opaque document disposed thereon with the surface having the indicia being adjacent to said support member, said support member being adapted to become opaque when electrically excited;
means for illuminating the opaque document, said support member being interposed between the opaque document and said illuminating means; and
means for electrically exciting said support member so that selected portions thereof become opaque to thereby mask predetermined regions of the indicia on the opaque document with the unmasked portions thereof being illuminated.

4,012,123
BINOCULAR DEVICE FOR DISPLAYING NUMERICAL INFORMATION IN FIELD OF VIEW

Harry V. Fuller, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 28, 1975, Ser. No. 608,482
Int. Cl.² G02B 27/14
U.S. Cl. 350—174 7 Claims



1. Apparatus for displaying, in the field of view of binoculars, numerical information about an object being viewed by the binoculars comprising:
binoculars, including an objective lens and two barrels;
means for sensing information about said object;
transmitter means for transmitting said information;
receiver means for receiving said transmitted information;
means for transforming said received information into nu-

merical form and displaying it on an incandescent readout; and

optical means attached to said binoculars for superimposing said incandescent readout onto the field of view of said binoculars.

4,012,124
ADJUSTABLE MOUNTING DEVICE FOR OPTICS LENS SYSTEMS

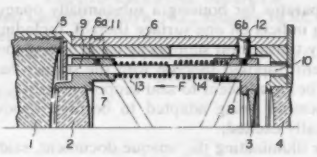
Katuhiko Toda, Yokohama; Mamoru Shimazaki, Tokyo, and Michiharu Suwa, Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 396,299, Sept. 11, 1973, abandoned. This application May 16, 1975, Ser. No. 578,269

Claims priority, application Japan, Sept. 14, 1972, 47-92339

Int. Cl.² G02B *15/14*

U.S. Cl. 350—187 **14 Claims**



1. A zoom lens mounting mechanism for an optical lens system having at least one variator lens and one compensator lens movable along a common optical axis, said mechanism comprising:

a. a first support means for said variator lens;

b. a second support means for said compensator lens;

c. position-adjusting means rotatable by external actuation and arranged upon rotation to move said variator lens and said compensator lens relative to each other along said optical axis, said position-adjusting means having:

1. a first cam groove slidably engaging said first support means and capable of moving said first support means along said optical axis through a distance dependent upon the amount of rotation of said position-adjusting means to thereby effect substantial variation of the position of said variator lens on said optical axis; and

2. a second cam groove slidably engaging said second support means and capable of moving said second support means along said optical axis through a distance dependent upon the amount of rotation of said position-adjusting means in a direction always opposite to that in which said first support means is moved by said first cam groove to thereby effect substantial variation of the position of said compensator lens on said optical axis; and

d. spring means arranged to exert forces always toward said first and second support means from a common direction almost parallel to said optical axis to urge said first and said second support means for abutment against respective one side walls of said first and said second cam grooves respectively;

whereby the force of said spring means acting on said position-adjusting means through said first and said second support means is reflected at two contact points between said first support means and said first cam groove and between said second support means and said second cam groove to respective directions, with those components of the reflected forces which act individually in either of the directions of rotation of said position-adjusting means being opposite in direction to each other to effectively cancel the spring force in the direction of rotation of said position-adjusting means.

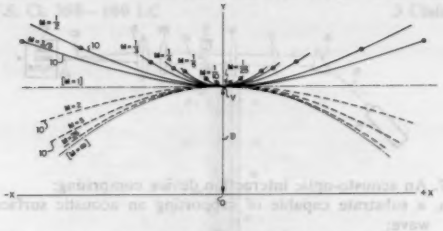
4,012,125
NONDISTORTING MIRRORS WITH SPECIFIED ANGULAR MAGNIFICATION OR DEMAGNIFICATION

Philip J. Hart, 843 Ross Court, Palo Alto, Calif. 94303

Filed Jan. 7, 1975, Ser. No. 539,050

Int. Cl.² G02B *5/10*

U.S. Cl. 350—296 **28 Claims**



1. A mirror having a reflective surface curved in at least one plane in accordance with the following mathematical relation (here expressed in polar coordinates):

$$r = \frac{D}{\left(\cos\frac{1+M}{2M}\theta\right)^{2M/(1+M)}},$$

where the mirror has a vertex and also has an axis of symmetry lying in said plane, passing through the origin of coordinates, intersecting the mirror at the vertex thereof, and intersecting the projection of a light ray that is incident at any given point on the mirror in said plane and that is reflected from the given point to the origin of coordinates; r (the radius vector) extends from the origin of coordinates to the given point on the mirror; D is a fixed distance and extends from the origin of coordinates to the vertex of the mirror; θ (the vectorial angle) is the angle subtended between the vertex of and the given point on the mirror relative to the origin of coordinates; M (the angular magnification) is the ratio of the angle θ to the angle subtended between the vertex of and the given point on the mirror relative to the point of intersection of said axis of symmetry with said projection; and M has a fixed value lying within the limits $0<M<\frac{1}{2}$, $\frac{1}{2}<M<1$, and $1<M<\infty$.

4,012,126
OPTICAL SYSTEM FOR 360° ANNULAR IMAGE TRANSFER

Gottfried R. Rosendahl, and Wiley V. Dykes, both of Winter Park, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1974, Ser. No. 458,610

Int. Cl.² G02B *13/06, 17/08*

U.S. Cl. 350—198 **3 Claims**

1. An optic1 system of 360° annular image transfer comprising:

spaced primary and secondary hyperbolically surfaced mirrors each having near and far focal points, said primary mirror having an apex;

said primary mirror being formed with a relatively small radius of curvature and small eccentricity in relation to said secondary mirror such that the angle difference between different rays accompanying and parallel to a chief ray in object space and in meridional plane becomes negligible;

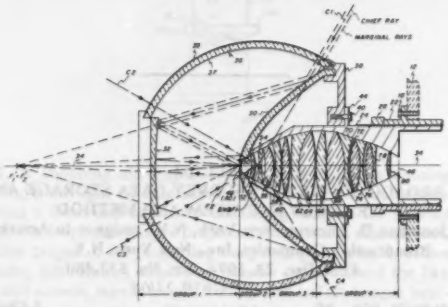
an envelope of optically suitable transparent material having an outer and inner surface generated in symmetry from said near focal point of said primary mirror and attached to said mirrors to hold the same in spaced axial symmetry;

a refraction lens system of positive and negative lens components;

said primary and secondary mirrors and said lens system constituting a total optical system having an entrance pupil;

said mirrors being faced with the mirrored surfaces toward each other and held in a spaced relationship by said envelope such that said entrance pupil of said total optical system coincides with the near focal point of said primary mirror, the near focal point of said secondary mirror approximates the apex of said primary mirror, and the far focal points of said mirrors coincide to form a confocal set of mirrors;

said primary mirror being centrally apertured to form an



aperture stop to pass reflected light rays to said refraction lens system;

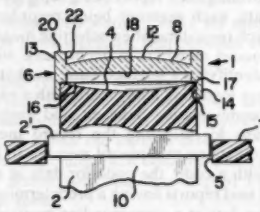
said refracrtive lens system including a heat resistant lens component of negative power between 0.75 and 1.25 of the overall power of the refractive system positioned in the immediate area of said aperture stop to provide a strong positive contribution to Petzval curvature of the system; and

three successive groups of lenses to respectively bend the chief rays toward the opticl axis of the lens system into approximately parallel position thereto, to provide correction for axial color and color magnification and finally to bring the light rays back to the image plane.

4,012,127
MAGNIFYING ATTACHMENT FOR TELEPHONE BUTTONS AND THE LIKE

Lawanda Charleen Bolander, 4230 Wiedenmann Place, Kansas City, Mo. 64111

Filed Sept. 17, 1975, Ser. No. 614,004
Int. Cl.² G02B *7/02;* **B41V** *5/12, 5/16*
U.S. Cl. 350—243 **6 Claims**



1. A magnifying attachment for use on push buttons such as those used on a touch dial telephone and the like, said attachment including:

a. a transparent image magnifying member having a convex outer disposed surface;

b. a peripheral skirt integral with and depending from said magnifying member for cooperative engagement with portions of a push button having indicia on an end thereof, said skirt mounting said magnifying member in overlying relation to said end and indicia for magnifying the indicia;

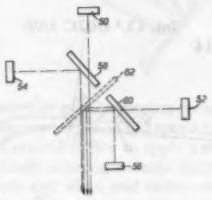
c. a shoulder on the interior of said skirt and engageable with said button end to limit movement of said skirt onto said button and position said magnifying member relative to said indicia;

d. an upstanding peripheral rib integral with and extending around said magnifying member and forming a shoulder for engagement with an operator's finger to prevent same from slipping off said magnifying member convex surface.

4,012,128
METHOD AND APPARATUS FOR DETERMINING VISUAL LATENCY

David Regan, Newcastle-under-Lyme, England, assignor to Wilkinson Sword Limited, England

Filed May 23, 1975, Ser. No. 580,474
Claims priority, application United Kingdom, June 7, 1974, 25352/74
Int. Cl.² A61B *3/02*
U.S. Cl. 351—17 **31 Claims**



1. A method of testing vision, including the steps of

producing randomly time-separated groups of visual stimuli each group consisting of a predetermined number of successive stimuli, each stimulus in a said group being separated from the next stimulus in that group by a controllable-length time interval,

varying the length of each said controllable-length time interval, and

assessing the minimum said controllable-length time interval for which the subject under test can discern the separate stimuli.

13. A method of testing vision, comprising the steps of

producing a visual stimulus of periodically varying intensity for a small discrete portion of a subject's visual field,

changing the amplitude of the intensity variations, and

assessing the minimum amplitude value for which the subject can discern the variations.

4,012,129
OPTICAL DEVICE FOR PRE-OPERATIVE CATARACT PATIENTS

William H. Byler, 690 Osceola Ave., Winter Park, Fla. 32789

Filed May 23, 1975, Ser. No. 580,318
Int. Cl.² G02C *7/16, 9/04*
U.S. Cl. 351—46 **12 Claims**

1. An optical device in combination with means for holding the device in position before the eye, said optical device including:

a. an opaque mask for mounting before the eye;

b. a horizontal slotted opening extending completely across said mask centrally thereof, said opening having a height of about 1 to 6 mm.;

c. an array of discrete circular transparent areas on said mask, said areas being disposed below said slotted open-

ing and each having equal diameters of between about 0.5 and 1.2 mm. and located on centers spaced equally from each other from between about 1.5 to 4 mm.;

d. said transparent areas providing light transmission in direction normal to the surface of between about 3 and 10 percent of the light striking the total area of the mask covered by said array; and

e. said mask being opaque above the slotted opening.

4,012,130

FRAMES FOR EYEGLASSES

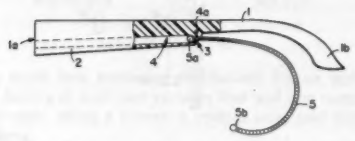
Henri Guillet, 2 Blvd. Georges Clemenceau, 01100 Oyonnax, France

Filed Feb. 9, 1976, Ser. No. 656,665

Claims priority, application France, Feb. 12, 1975, 75.04905

Int. Cl.² G02C *5/06*

U.S. Cl. 351—114 **6 Claims**



1. In an eyeglass frame of the type having temple members extending rearwardly from a main frame to which they are pivoted, each temple member comprising:

a rigid member having an inner end and having an outer end terminating in a rigid earpiece shaped to pass over the ear and extend behind it;

a flexible earpiece member attached to said temple member intermediate its inner and outer ends and shaped normally to assume an arcuate position beneath the rigid earpiece to grip the ear and hold the glasses frame more tightly against the face of the wearer;

means selectively operable to retract the flexible earpiece member from its normal position and release its grip on the ear,

said selectively operable means comprising means for retracting the flexible earpiece member and positioning and holding the flexible member against the underside of the rigid earpiece, whereby the flexible earpiece member lies along the rigid earpiece and conforms with the shape thereof.

4,012,131

HIGH STRENGTH OPHTHALMIC LENS

David A. Krohn, Southbridge, Mass.; Emil W. Deeg, Woodstock, Conn., and Robert E. Graf, Southeridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Aug. 20, 1975, Ser. No. 606,033

Int. Cl.² G02C *7/02*

U.S. Cl. 351—159 **7 Claims**

1. A chemically-strengthened ophthalmic glass lens having a compressively-stressed ion-exchanged surface zone that is at least 60 microns in depth, said lens being formed from a silicate glass comprising by weight about 3 to about 11 percent sodium oxide, about 7 to about 15 percent potassium oxide, up to about 5 percent of other alkali metal oxides, about 12 to about 20 percent of a total of sodium and potassium oxides and other alkali metal oxides, a minimum of 3 to about 6 percent of calcium oxide, the calcium oxide being balanced by an amount of about 3 to about 11 percent of a metal oxide selected from the group consisting of zinc oxide, magnesium oxide, and mixtures thereof, the oxides selected from said group being present in an amount sufficient to assure that the rate of diffusion and depth of penetration obtained during ion exchange of said lens is not detrimentally affected by the presence of the calcium oxide during ion exchange, and the balance of lens being silica.

4,012,132

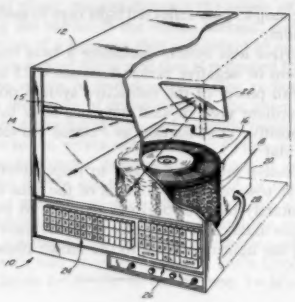
BROADCAST MARKET SURVEY DATA STORAGE AND RETRIEVAL SYSTEM AND METHOD

Jonathan D. Lazarus, New York, N.Y., assignor to American Broadcasting Companies, Inc., New York, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,480

Int. Cl.² G03B *23/08*

U.S. Cl. 353—25 **4 Claims**

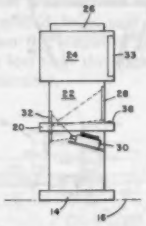


1. A system for storing and retrieving market research information, said information including reports from a plurality of different sources, said system comprising a plurality of photographic record members, each bearing, in reduced size, the information for an integral number of basic market categories, each of said record members bearing corresponding reports from each source for the same market category, the information forming each report being separated into a plurality of segments, each segment being recorded at the same position on each record member, selecting means for selecting one of said record members in accordance with a predetermined code identifying a selected basic market category, said selecting means including a keyboard with a plurality of keys, means for communicating between said keyboard and said selecting means for selecting the record member and the position of the data on said record member to be displayed in accordance with a code, the code for data at any given position of one of said reports having a predetermined relationship to the code for data at a corresponding position of each other of said reports, in order to facilitate switching back and forth between different reports rapidly, the keys on said keyboard being arranged so that a key for one data item in one report is located immediately adjacent to the corresponding key for the corresponding data item on another report so as to facilitate the display of corresponding data from each of the reports, said selecting means including means for changing the illuminated image from one to another corresponding report.

4,012,133
SHOPPING AID DISPLAY VIEWER

James J. Burton, Mendenhall Drive, Winston-Salem, N.C. 27107

Filed Sept. 22, 1975, Ser. No. 615,397
Int. Cl.² G03B *23/02*
U.S. Cl. 353—25 10 Claims



1. A shopping aid display viewer comprising: a housing having a daylight viewing screen formed therein, said screen having a front and back side and being adapted for viewing from the front side images projected on the back side thereof; a slide projector for projecting images of photographic slides bearing information about purchasable products and the like on said screen; mirror means arranged to reflect images bearing information projected by said slide projector onto the back side of said viewing screen; a second viewing area carried by said housing having a front and back side and being adapted for viewing from outside said housing; a locator map displayed on said second viewing area; means associated with said locator map selectively indicating thereon upon actuation a specific location where said purchasable product and the like may be found; automatic telephonic means supported by said housing; a control panel having means to selectively and automatically control said projector, said locator map associated means, and said telephonic means whereby an image bearing information about purchasable products and the like can be projected on said viewing screen, a location for purchasing such products and the like can be designated on the locator map, and the location can be connected automatically through the telephone means.

4,012,134
BIDIRECTIONAL WEB MEDIUM DRIVE

Edward S. Silver, Hackensack, and Robert E. Tucker, Passaic, both of N.J., assignors to Computer Specialties Corporation, Palisades Park, N.J.

Division of Ser. No. 468,353, May 9, 1974, Pat. No. 3,926,513.
This application Dec. 12, 1975, Ser. No. 640,095
Int. Cl.² G03B *23/12*; B65H *59/00*; G03B *1/04*; G11B *15/32*
U.S. Cl. 353—26 R 5 Claims

1. A bidirectional web medium drive for moving a web of material such as a photographic film between two reels comprising:

first and second reversible motors;

drive means each having an input coupled to the output of each of said motors, and an output which is restricted from rotation unless the input is driven;

first and second spindles each connected to each output of said drive means, said spindles adapted to receive and support the reels;

a torque controller coupled to one of said motors for maintaining an output torque to that motor;

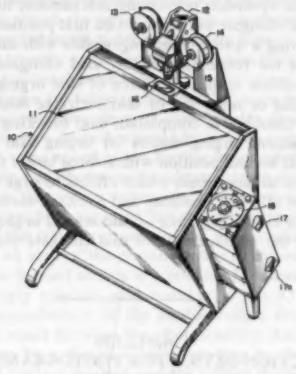
at least two spaced-apart idler rollers pivotably disposed between the reels for contact with one side of the web so that when a torque is applied to the web by the takeup reel, the web is held substantially planar between said idler rollers;

a projector having its optical axis disposed between the idler rollers and normal to the web surface;

a screen disposed in the projection path of said projector for displaying images formed on said web;

a variable speed controller coupled to the other of said motors for controlling the output speed of that motor; and

switch means coupled to said torque and speed controllers for running said first and second motors in the same direction, said switch means having at least two positions so that when said switch means is in a first position, the torque controller is connected to said first motor to apply

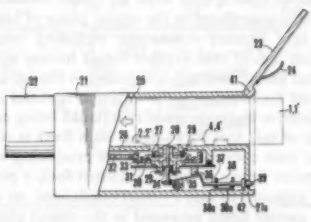


a torque to said first spindle causing its associated reel to be the web take-up reel, and the speed controller is connected to said second motor to apply a selected speed to the second spindle causing its associated reel to be the web supply reel, and when said switch means is in a second position, said torque controller is connected to said second motor and said speed controller is connected to said first motor and the direction of rotation of said motors is reversed so that the reel on said first spindle becomes the supply reel and the reel on said second spindle becomes the take-up reel.

4,012,135
MOTION PICTURE CAMERA

Yoshio Komine, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1975, Ser. No. 557,304
Claims priority, application Japan, Mar. 15, 1974, 49-29815; June 5, 1974, 49-63788; June 5, 1974, 49-63789; June 6, 1974, 49-64383
Int. Cl.² G03B *23/02*
U.S. Cl. 352—72 23 Claims



1. A motion picture camera provided with a cartridge chamber to be charged with a film cartridge of the type having a disengageable reversion preventing mechanism and a device for selectively disabling the reversion preventing mechanism of said film cartridge charged within said cartridge chamber,

said camera further comprising an elongate pin having a head portion thereof, said portion being selectively engageable with the reversion preventing mechanism of said film cartridge charged within said cartridge chamber, said elongate pin further having a flange for limiting the extension of the head portion into said cartridge chamber; means mounting thereon said elongate pin for movement between a first position wherein said head portion is effective to disable the reversion preventing mechanism of said charge cartridge and a second position wherein said elongate pin is in a retracted position relative to the cartridge chamber so as to be ineffective to disable said reversion preventing mechanism; first means for urging said elongate pin toward said first position, said urging means having a spring being engageable with said pin; blocking means for retaining forcedly said elongate pin in said second position against the force of said urging means until the charging or removing of said cartridge into or from the cartridge chamber is completed; said blocking means comprises a second urging means for urging said elongate pin toward said second position with a force larger than the force of said first urging means which effects to urge said elongate pin toward said first position, and a release member for overcoming the energizing force of said second urging means so as to permit the displacement of said elongate pin to said first position.

4,012,136
PROJECTION DEVICE FOR PHOTOGRAMMETRICAL PURPOSES

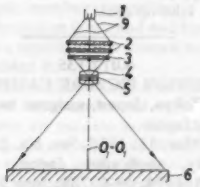
Harald de la Croix, Weimar, and Wilfried Müller, Jena, both of Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Feb. 5, 1975, Ser. No. 547,752

Claims priority, application Germany, Mar. 5, 1974, 176944

Int. Cl.² G03B 21/20, 21/14

U.S. Cl. 353—102 **6 Claims**



1. A projection device of wide angular field of lens, comprising, in sequence along and in alignment with an optical axis, a light source for emitting a bundle of white light symmetrically about said optical axis, a Fresnel condensor, said light source being arranged in the object plane of said Fresnel condensor, said Fresnel condensor including two Fresnel lenses, at least one of said Fresnel lenses having at least two sets of Fresnel flanks each set comprising *n* flanks, each flank having at least foci F_1, F_2–F_n for different spectral colors C_1, C_2–C_n, the relative inclinations of said flanks being such that a different one of said foci F_1, F_2–F_n of each flank is coincident, to constitute said condensor as means producing a substantially achromatic image at said coincident foci, a picture carrier located adjacent to said Fresnel condensor, an objective, said picture carrier being arranged in the object plane of said objective, a diaphragm being provided in said objective and disposed at said coincident foci, said diaphragm passing substantially only light focussed at said coincident foci and being arranged substantially in the image side focal plane of said Fresnel condensor, and a projection table being located in the image plane of said objective, said image plane being optically conjugated to the object plane of said objective.

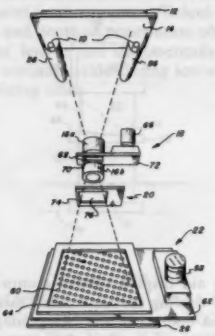
4,012,137
OPTICAL SYSTEM HAVING A ROTATING SCREEN

Robert N. Goren, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 17, 1975, Ser. No. 541,748

Int. Cl.² G03G 15/26

U.S. Cl. 355—4 **14 Claims**



1. An optical system for projecting a light image of an original document onto a light sensitive member, including:

means for illuminating the original document;

means, in a light receiving relationship with the light rays transmitted from the original document, for forming a light image thereof,

a screen member interposed in the optical path so that the light image passes therethrough;

means for rotating said screen member at a substantially constant angular velocity;

means for activating said illuminating means at pre-selected time intervals as said screen member rotates to generate successive half-tone light images at different angles of said screen member;

a substantially opaque member having a plurality of different size apertures therein, said opaque member being operatively associated with said image forming means; and

means for rotating said opaque member in synchronism with the rotation of said screen member, said opaque member being rotated to locate a pre-selected size aperture in the optical light path upon actuating said illuminating means.

4,012,138
ELECTROSTATIC PHOTOGRAPHIC COPYING APPARATUS

Takaji Washio, Toyonaka, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Filed Nov. 26, 1973, Ser. No. 419,047

Claims priority, application Japan, Nov. 30, 1972, 47-120246

Int. Cl.² G03G 15/30

U.S. Cl. 355—8 **12 Claims**

9. In an electrostatic photocopying apparatus:

a drum, with a photosensitive element of a predetermined length, extending therearound, so as to encompass a first angle;

a carrier for moving an original image to be copied:

an imaging station;

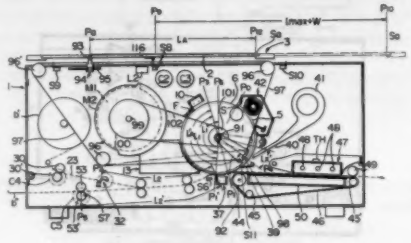
means for focusing a portion of the original image onto the photosensitive element of the drum at said imaging station;

means for rotating the drum, past the imaging station to expose successive portions of said photosensitive element with said focusing means;

means for advancing said carrier relative to said imaging station from an initial position spaced from said imaging station to focus successive portions of said original on said photosensitive element;

means for coordinating the advance of the carrier with the rotation of the drum to duplicate the original image, as a charge image on the drum;

means for advancing copy paper to a transfer point, wherein said transfer point is juxtaposed with said drum and circumferentially spaced from said imaging station by a distance less than the length of photosensitive element and by an angle less than the angle encompassed by the photosensitive element;



means for coordinating the advancing means for copy paper, so that the copy paper arrives at the transfer station, when the charge image on the photosensitive element of the drum arrives at the transfer station;

means for returning said carrier to the initial position thereof, after one revolution of said drum during which a portion of the image is transferred to the copy paper; and

means for subsequently advancing said carrier only after a subsequent revolution of said drum, in order that the entire length of said photosensitive element may engage said copy paper, the portion not engaging said copy paper on the first revolution engaging the copy paper on the second revolution.

4,012,139

ELECTROSTATIC COPYING APPARATUS HAVING COPY PAPER CUT LENGTH CONTROL

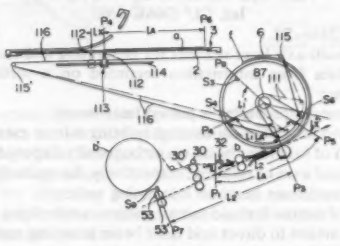
Takaji Washio, Toyonaka; Koichi Sasaki, and Tatsuo Aizawa, both of Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Division of Ser. No. 399,516, Sept. 21, 1973, Pat. No. 3,923,391. This application Apr. 22, 1975, Ser. No. 570,427

Claims priority, application Japan, Sept. 24, 1972, 47-95460

Int. Cl.² G03G *15/00*

U.S. Cl. 355—13 **5 Claims**



1. An electrostatic photographic copying apparatus comprising:

a frame member having a transparent plate on which to place an original to be copied;

a rotatable photosensitive drum having an electrostatic photographic material on the periphery thereof;

an optical system for projecting an image of the original onto the surface of the photographic material;

an image-forming zone disposed exteriorly of, and alongside, the periphery of said photosensitive drum for forming on said photographic material, an electrostatic latent image corresponding to the image of the original or a developed image corresponding to the latent image;

a transfer zone for transferring said image to a transfer paper; and

a transfer paper forwarding system for feeding the transfer paper on which the image has been transferred to a discharge end through a desired treating zone;

wherein said transfer paper forwarding system includes means for supplying a continuous web of transfer paper, a cutting device and means for bringing the transfer paper into contact with said photosensitive drum in said transfer zone; wherein said photosensitive drum is rotated by a drive system at substantially the same speed as the feeding speed of the transfer paper: wherein said photosensitive drum drive system and said transfer paper forwarding system are interconnected by first and second switch means, said first switch means starting the operation of the transfer paper feeding means when the forward end of an area of the photosensitive drum on which an image is to be formed arrives at a position to initiate the start of paper supply wherein said position is spaced upstream along the circumference of the photosensitive drum from a position of contact between the photosensitive drum and the transfer paper by a distance corresponding to the distance between said contact position and the cutting position of said cutting means;, said second switch means having a position adjusting member associated therewith capable of adjusting the position of the second switch according to any desired copying length corresponding to the length of the original to be copied, said second switch means actuating the transfer paper cutting means and stopping the paper feeding means when due to the rotation of the photosensitive drum said forward end point has advanced the desired copying length corresponding to the original after the actuation of the first switch means.

4,012,140

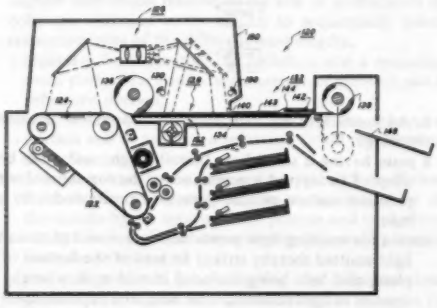
COPIER DOCUMENT LOADING SYSTEM

Dennis P. Gerbasi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 30, 1975, Ser. No. 600,331

Int. Cl.² G03G *15/28;* G03B *27/62*

U.S. Cl. 355—76 **2 Claims**



1. In a copying apparatus in which documents having a given front edge to rear edge dimension are manually loaded for copying onto an advanceable integral document supporting and transporting web including vacuum document retaining means for retaining documents without slippage on said integral web for copying, the improvement in document load-

ing and registration means for assisting in the manual loading of documents onto said web front edge first with a pre-registered non-skewed orientation of the documents relative to said web without restraining the front edge of the documents, comprising:

slidable document supporting surface means extending to a terminating edge closely adjacent said web for only partially, slidably, supporting a rear portion of a document,

document rear edge stop means transverse said document supporting surface means for manually registering the rear edge of the document on said document supporting surface means with a front portion of the same document partially overlying said web,

said document rear edge stop means being spaced from said terminating edge of said document supporting surface means and said web by a distance less than the front to rear edge dimensions of the document being registered,

said document rear edge stop means extending upwardly relative to said document supporting surface means and transversely to said web,

and means for advancing said web after a document has been registered against said rear edge stop means with said vacuum document retaining means activated to prevent slippage between said web and the document and to pull the entire document slidably from said document supporting surface means onto said web.

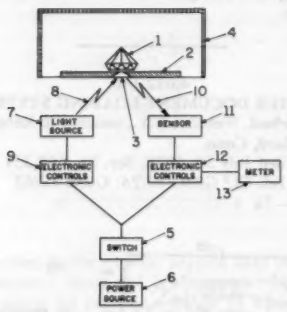
4,012,141
IDENTIFICATION OF GEMSTONES BY RELATIVE REFLECTANCE MEASUREMENTS COUPLED WITH A SCALE CALIBRATED IN GEM NAMES

Walter William Hanneman, 18675 Sheffield Road, Castro Valley, Calif. 94546

Continuation of Ser. No. 524,647, Nov. 18, 1974, abandoned. This application Mar. 10, 1976, Ser. No. 665,573

Int. Cl.² G01N *21/48*

U.S. Cl. 356—30 **8 Claims**



1. An instrument for identification of polished gemstones, comprising:

a plate having a small hole therethrough, said plate being adapted to support a gemstone on the top thereof with a polished surface of said gemstone positioned over said hole;

means for emitting light positioned under said plate so that light emitted thereby strikes an area of the bottom of the plate, said hole being included in said area, whereby the amount of light reflected from said area depends upon the presence or absence of a gemstone over said hole, and upon the reflectance of any gemstone so present;

means for receiving light reflected from said area and for converting the amount of light received to an electrical signal;

a meter having a scale calibrated in accordance with the relative reflectances of various gemstones; and

means for connecting the electrical signal to said meter, whereby said meter provides an indication of the identity of a gemstone positioned over said hole.

4,012,142
COPYING MACHINE

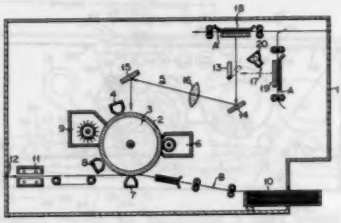
Shiro Serikawa, Akishima, Japan, assignor to Copyer Co. Ltd., Tokyo, Japan

Filed Aug. 28, 1975, Ser. No. 608,712

Claims priority, application Japan, Sept. 2, 1974, 49-105568[U]

Int. Cl.² G03B *27/70, 27/54*

U.S. Cl. 355—66 **5 Claims**



1. A copying machine comprising a housing having first and second original exposing sections to receive an original in position, photosensitive means provided within the housing, an optical system for illuminating said first and second original exposing sections and selectively directing to said photosensitive means a light reflected from the original in the original exposing section, and means for copying the original through said photosensitive means, said optical system including a selective optical member for permitting a real image to be obtained from the original in the first original exposing section when it is brought into a first position and a mirror image to be obtained from the original in the second original exposing section when it is brought into a second position including a reflector adapted to reflect the light from one of said first and second original exposing sections, a light source for selectively illuminating said first and second original exposing sections, and a shield cover for said light source selectively movable between a first position and a second position and adapted to illuminate said first original exposing section when it is brought into said first position and said second original exposing section when it is brought into said second position.

4,012,143
MULTI-AXIS LASER SCANNER

David J. Buscher, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 621,320

Int. Cl.² G06K *9/08*

U.S. Cl. 356—71 **8 Claims**

1. A multi-axis laser scanner for generating and compacting digital data from information recorded on a surface area, comprising:

laser means providing a pulsed laser beam;

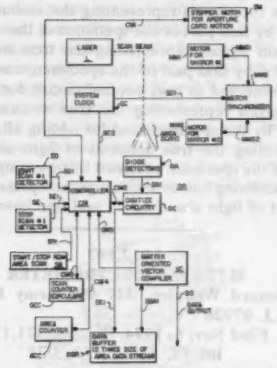
first and second multi-faceted rotating mirror means in the path of said laser beam on orthogonally disposed first and second axes of rotation, respectively, for mutually reflecting said laser beam in a scanning raster;

control means for said mirror means constraining said mirror means to direct said laser beam scanning raster over a predetermined pattern of discrete areas;

information means having an information containing surface comprising a major information area consisting of a plurality of incremental information areas each definable by said predetermined pattern of discrete areas;

feed means for said information means sequentially presenting each of said plurality of incremental areas into the path of said laser beam to be scanned by said raster in said predetermined pattern of discrete areas;

detecting and digitizing means responsive to the interaction of said scanning raster and said information surface providing a plurality of discrete digital data streams representative of the information on said major information area as obtained from each discrete area in said predetermined pattern; and



matrix oriented data compaction means receiving said discrete data streams and providing a compacted completely determinister output data stream representative of the total information on said major information surface.

4,012,144

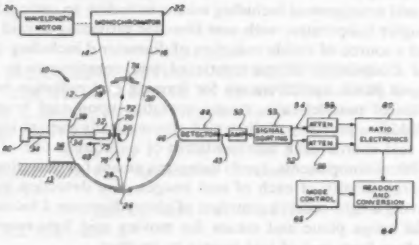
SPECTROSORPTANCE MEASURING SYSTEM AND METHOD

Sidney Hedelman, San Francisco, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Aug. 7, 1975, Ser. No. 602,841

Int. Cl.² G01N *21/00*; G01J *1/04*

U.S. Cl. 356—73 **9 Claims**



1. Apparatus for measuring the absolute absorptance of a relatively thin sample displaying both specularly reflecting and transmitting characteristics, comprising:

an integrating sphere;

means for directing relatively monochromatic reference and sample beams into said sphere from a pair of angularly spaced ports;

detector means positioned at said sphere to receive illumination from said internal sphere wall, including the illumination arising from the first reflectance from that portion of the sphere wall directly illuminated by said sample and reference beams;

baseline compensator means for equalizing the reference and sample electrical signals from said detector with said sample removed from said sample beam;

means for positioning said sample within said sphere in the path of said sample beam, and at such position with respect to said detector that said detector views the illumination of the sphere wall, and substantially excludes the specular and scattered components of the reflected and transmitted light energy from said sample until after said energy strikes the sphere wall;

ratio electronics means for comparing the light falling on said detector due to illumination of the sphere wall via the sample to the light falling on said detector due to illumination by said reference beam, thereby to directly measure the quantity of incident sample beam energy transmitted and reflected by said sample; and

means for converting the determined ratio into absorptance of the said sample.

4,012,145

SPECTROSCOPIC ANALYSIS APPARATUS EMPLOYING MEASUREMENT AND REFERENCE RADIATION

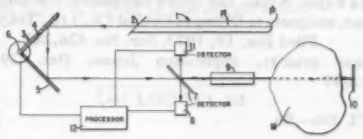
Francois Marie Maurice Chabannes, Paris; Edouard Sylvain Milot, Boulogne; Pierre Raymond Louis Godfrin, Suresnes, and Pierre Philippe Louis Mailly, Villejuif, all of France, assignors to Etat Francais, France

Filed Sept. 6, 1974, Ser. No. 503,759

Claims priority, application France, Sept. 20, 1973, 73.33695

Int. Cl.² G01J *3/42*

U.S. Cl. 356—88 **23 Claims**



1. Apparatus for the spectroscopic analysis of a sample of material for determining the chemical composition of the sample, the apparatus comprising:

a coherent radiation source for producing, in succession, respective ones of a plurality of different wavelengths of the coherent radiation, the source having an active material from which there can be produced the said different wavelengths of coherent radiation, reflecting means for reflecting radiation in the source, and

a wavelength selecting means operable by variation of its angular orientation relative to the axis of propagation of coherent radiation in the source to sequentially select respective ones of the different wavelengths;

a separator for separating the radiation into a measurement portion for irradiating a sample of material and a reference portion;

a reference detector arranged to receive the reference portion and to produce a reference signal representing the reference portion;

a measurement detector arranged to receive the radiation from the sample of material due to the irradiation of the sample by the measurement portion and to produce a measurement signal representing the said radiation from the sample; and

a processing circuit for processing the reference and measurement signals in dependence upon variation of the said angular orientation of the selecting means to produce numerical data relating to the spectral analysis of the sample;

said processing circuit comprising:

an angular position detecting means for producing position signals representing the angular orientations of the selecting means relative to the said axis of progation:

a selector arrangement connected to receive the position signals for producing indicator signals indicating a particular orientation of the selecting means, and thus the production of a particular wavelength of radiation, and indicating that the reference and measurement signals associated with that orientation are to be processed by the processing circuit;

a comparator connected to receive the reference signals and operable to produce a comparison signal indicating the presence of a reference signal;

first and second, controllable data producing circuits connected to receive the reference and measurement signals respectively to produce analogue signals representing data relating to the spectroscopic analysis of the sample;

a trigger arranged to produce, in dependence upon the comparison signal and the indicator signal, a control signal for the data producing circuits;

first and second analogue to digital converters connected to receive the analogue signals from the first and second data producing circuits respectively; and

an interface circuit connected to receive the said data from the converters.

4,012,146

TWO WAVE LENGTH, SCANNING AND INTEGRATION TYPE METHOD OF MICROSPECTROPHOTOMETRICALLY MEASURING THE LIGHT ABSORBANCY OF A SPECIMEN AND MICROSPECTROPHOTOMETER FOR AUTOMATICALLY CARRYING OUT THE METHOD OF MEASUREMENT

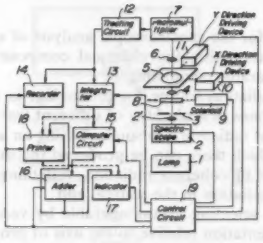
Setsuya Fujita, Kyoto, and Ichiro Sawamura, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1973, Ser. No. 426,240

Claims priority, application Japan, Dec. 20, 1972, 47-127097

Int. Cl.² G01J 3/42

U.S. Cl. 356—96 **2 Claims**



2. A two wave length, scanning and integration type microspectrophotometer for measuring the total amount of light absorbed by a colored specimen, comprising:

a control circuit

means connected to said control circuit for moving said specimen in X and Y directions,

means for producing light spots having wave lengths λ_1, λ_2 whose light absorbancies to the color of the specimen are maximum and minimum, respectively,

means connected to said control circuit for sequentially scanning a part of said specimen along the same path in the X direction by means of said light spots and changing over the wave length λ_1 to the wave length λ_2 and vice versa,

means connected to said control circuit for detecting the light transmitted through the specimen to produce an electrical signal indicative of the light absorbancy of the specimen,

means connected to said control circuit for screening the light path during said changing over operation and during movement of the specimen in the Y direction

means connected to said control circuit for integrating the signals indicative of said absorbancy every one scanning step to obtain signals representing the amount of light absorbed by a part of said specimen,

means connected to said control circuit for accumulating said signals representing the amount of light absorbed by said part of the specimen every one scanning step and for subtracting the signals representing the amount of light absorbed by said part of the specimen at the wave length λ_2 from the signals representing the amount of light absorbed by said part of the specimen at the wave length λ_1 to obtain signals representing the true amount of light absorbed by said part of the specimen, and

means connected to said control circuit for accumulating said signals representing the true amount of light absorbed by the specimen and for adding all of said signals representing the true amounts of light absorbed by all parts of the specimen obtained by repeating said scanning every scanning line to obtain signals representing the total amount of light absorbed by said specimen.

4,012,147

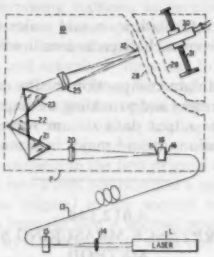
SLIT-LESS SPECTROMETER

George Edouard Walrafen, 347 Old Army Road, Basking Ridge, N.J. 07920

Filed Nov. 6, 1974, Ser. No. 521,178

Int. Cl.² G01J 3/10, 3/28

U.S. Cl. 356—98 **2 Claims**



1. A spectrometer arrangement comprising a rigid support member and optical means affixed thereto for defining an optical path between an object plane and an image plane, said arrangement being adapted for receiving an optical fiber including core constituents and having a first end of diameter d, said arrangement including means including an optical fiber coupler cooperative with said fiber for providing at said first end a source of visible radiation of diameter d including spectral components characteristic of said constituents in said object plane, optical means for forming said radiation into a beam of parallel rays, means operative upon said beam to produce a plurality of dispersed chromatically variant images of said source each representative of a different one of said spectral components, (and) detection means for detecting the energy density of each of said images, said detection means having a light-receiving surface of about diameter d located in said image plane and means for moving said light-receiving surface from one of said images to another.

4,012,148

PROJECTION SCOPE AND POSITIONING SYSTEM

William F. Marantette, and Ruth B. Marantette, both of 20624 Earl St., Torrance, Calif. 90503

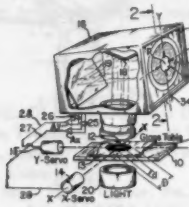
Filed Dec. 15, 1975, Ser. No. 640,494

Int. Cl.² G01B 11/26; G02B 27/34

U.S. Cl. 356—172 **7 Claims**

1. A method for automatically positioning an art work target in the form of an annular opaque pad having a transparent center at the precise center of a given point and visually viewing the centering operation, including the steps of:

a. projecting an image of the art work target onto a rear projection screen;
b. positioning two pairs of identical elongated photo cells along two X and Y orthogonal axes respectively at points equally spaced a given distance from the intersection point of said orthogonal axes so that the photo cells in the pair on the X axis are equally spaced on either side of the intersection point in the X direction and the photo cells in the pair on the Y axis are equally spaced on either side of the intersection point in the Y direction;
c. mounting said two pairs of photo cells behind the rear projection screen so that the shadows cast by said photo cells appear on said screen superimposed on said image, said intersection point of said X and Y axes defining said given point on which said target is to be centered;
d. moving said photo cells making up said two pairs in directions towards and away from said intersection point until a portion of the shadow cast by each of said cells appears in the opaque pad area of said image and the



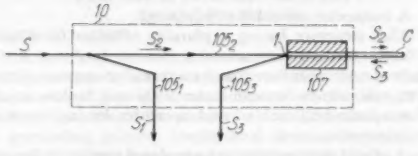
remaining portion appears in the transparent center of said image, the equal spacing of the photo cells from said intersection point being maintained;
e. detecting the light responsive signals from each of said photo cells;
f. generating an X output signal constituting a function of the difference in the output signals from said pair of cells lying on said X axis;
g. generating a Y output signal constituting a function of the difference in the output signals from said pair of cells lying on said Y axis, and,
h. automatically energizing X and Y servo motors with said X and Y output signals to shift said art work target in X and Y directions to thereby shift the position of said image relative to said X and Y axes until the transparent center of said art work image precisely coincides with said intersection point at which time the X and Y signals are zero so that said servo motors are automatically de-energized.

4,012,149

MEASURING METHOD AND EQUIPMENT FOR LOCATING A BREAK IN AN OPTICAL CABLE

Rémy A. Bouillie, route de Treguier, Lannion, France (22300), and Pierre Lamouler, Maudez, Lanvellec, France (22420)

Filed July 1, 1975, Ser. No. 592,167
Claims priority, application France, July 26, 1974, 74.25993
Int. Cl.² G01N *21/16, 21/32*
U.S. Cl. 356—237 **2 Claims**



1. An apparatus for determining the position of a break in a fiber of an optical cable comprising:
generating and directing means providing a train of recurrent light pulses toward an end of said optical cable;
said generating means including a laser source of said recurrent light pulses, an electrical pulse generator, means to feed electrical power to said generator and an amplifier connecting said generating means and said laser source;
an optical separator means located along the emitting axis of said light pulses generated from said laser source comprising at least a first, a second and a third optical fiber for dividing said train of said light pulses into a first train of light pulses along said first optical fiber, a second train of light pulses along said second optical fiber, and for reflectively directing a third train of light pulses along said third optical fiber;
optical concentrator means for directing said second train of light pulses to the end of the optical cable being tested;
first receiving means including a first electro-optical transducer for receiving said first train of light pulses and converting said first train of light pulses into a first electrical signal;
second receiving means including a second electro-optical transducer for receiving said third train of light pulses reflectively along said third optical fiber of said optical separator means after said second train issues from said second optical fiber and is reflected from said second train of light pulses by a break in the fiber of said optical cable;
said second receiving means converting said third train of light pulses into a second electrical signal; and,
electrical time measurement means receiving said first and second electrical signals for measuring the time delay interval between a light pulse of said first train and a light pulse of said third train to thereby determine the position of the break in a fiber of said optical cable.

4,012,150

HOLOGRAPHIC LIGHT LINE SIGHT

Juris Upatnieks, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Aug. 18, 1975, Ser. No. 605,404
Int. Cl.² G02B *27/34*
U.S. Cl. 356—247 **10 Claims**

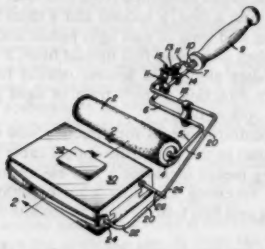
1. A sight of the type described comprising: a substantially transparent plate having formed thereon a hologram recording a single line of light on an otherwise substantially blank surface, the recorded light line having one end proximite the hologram and the other end relatively distant from the hologram and terminating at a point within the field of view of the major portion of the hologram; a coherent light source; optical means for illuminating the hologram with the light source to reconstruct a virtual image of the light line so that an observer viewing a scene through the illuminated hologram may observe the super-position of the light line with the scene.

4,012,151

ATTACHMENT FOR HAND OPERATED PAINT ROLLERS

Brower C. Spransy, 4516 Rynex Drive, Alexandria, Va. 22312

Filed Mar. 24, 1975, Ser. No. 561,616
Int. Cl.² A47L *1/08;* B43M *11/02*
U.S. Cl. 401—23 5 Claims



1. In combination with a cylindrical paint-applying roller which includes a support means extending axially from one end of the roller, said support means including a section which is parallel to the axis of the roller, and a further section which extends from said first-named section substantially perpendicularly to the axis of the roller; an elongated extension which occupies a plane which is perpendicular to the axis of the roller and is adjacent and movably attached to said section of the support means which is perpendicular to the axis of the cylinder, said extension comprising a right-angularly extending section which is parallel with the axis of the roller, an elongated section which extends beyond the axis of the roller, and a section which extends right-angularly from said elongated section and into parallelism with said roller; a section which extends between and in parallelism with said last-named section and said roller, a paint container carried by said two last-mentioned sections and extending parallel with and in front of said roller, and a paint-applying pad removably carried by and in communication with the interior of said paint container.

4,012,152

PAINT-APPLYING DEVICE

Wilhelm F. Lupkes, Kaap Hoorn 13, Veendam, Netherlands

Filed July 24, 1975, Ser. No. 598,960
Claims priority, application Netherlands, Dec. 5, 1974, 7415896
Int. Cl.² B43M *11/02*
U.S. Cl. 401—218 7 Claims

1. A paint applicator comprising:

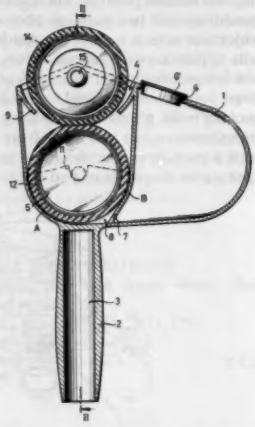
a housing having a handle and forming a roller compartment adjacent said handle;

a paint transfer roller having a cylindrical profile and a paint applicator roller rotatably disposed parallel and operatively abutting each other in said roller compartment and being oriented perpendicularly and centrally disposed in tandem to said handle, said paint transfer roller being adjacent said handle, the roller compartment including side walls and end walls, said side walls having flanges extending from the edges of said end walls inwardly to the interior of said housing defining a housing outlet through which said paint applicator roller projects;

said housing outlet defining edges of the housing adjacent to a cylindrical surface of said paint applicator roller, said flanges extending from said housing outlet into said housing in a direction towards said transfer roller and away from said side walls;

a partition wall joined to one of said side walls and laterally adjacent said rollers dividing said housing into said roller compartment and a separate paint container, said partition wall being substantially parallel to said handle and curving at a portion adjacent thereto arcuately toward said handle and defining thereat an aperture means opening into said roller compartment adjacent said handle;

each of said flanges together with said paint applicator roller defining a slot which diverges outwardly from an interior of said housing to the exterior thereof, and one of said flanges together with one of said side walls and the other of said flanges with said partition wall forms therebetween means to prevent the free flow of paint out of said housing outlet;



said housing having wall portions at the interior of said end walls which closely follow the cylindrical profile of said transfer roller to prevent the flow of paint around the ends of said transfer roller; and

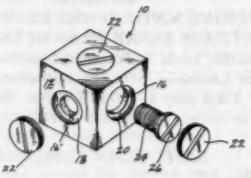
recess means formed in said end walls of said housing in said roller compartment in a portion adjacent said handle, said transfer roller including axle portions rotatably disposed in said recess means, the latter opening in a direction toward said housing outlet and substantially having a U-shape for removably receiving said axle portions.

4,012,153

STRUCTURAL CONNECTION MEANS

Martin J. Pidgeon, 7123 Bellaire Ave., Des Moines, Iowa 50311, and Roy E. Green, 8900 Carole Circle, Des Moines, Iowa 50322

Filed Mar. 21, 1975, Ser. No. 560,774
Int. Cl.² F16D *1/00*
U.S. Cl. 403—170 10 Claims



1. A connector assembly comprising,

a block structure having a plurality of outer faces and a hollow interior compartment,

each of said outer faces having a threaded aperture formed therein which communicates with said hollow interior compartment, each of said apertures having inner and outer ends,

each of said apertures having a recessed portion at the outer end thereof which is in communication with the respective outer face, the inner end of each of said apertures being in communication with said compartment,

structural components being positioned in an abutting relationship adjacent at least some of the outer faces of said block structure and having internal threaded portions registering with the said aperture formed in the associated outer face, said structural components having planar surfaces,

a threaded stud bolt threadably received by the said aperture and internal threaded portions of said structural components, one end of said stud bolt being positioned in said internal threaded portion, the head portion of said stud bolt being positioned in said interior compartment closely adjacent the inner end of said aperture so that said stud bolts do not interfere with each other,

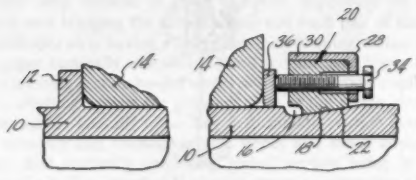
said apertures which receive said stud bolts having means associated therewith for limiting the longitudinal movement of said stud bolt relative thereto so that said structural components may be drawn into rigid abutting engagement with said associated outer face so that the planar surfaces of said structural components are properly aligned with the outer faces of said block structure; said recesses being adapted to receive a closure plug therein.

4,012,154

THREADLESS LOCKING DEVICE

Robert J. Durwin, Trumbull, and Joseph H. Mancini, Shelton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 28, 1973, Ser. No. 401,799
Int. Cl.² F16B *21/00*
U.S. Cl. 403—261 **7 Claims**



1. In combination, a shaft having an annular indentation including a conical bottom surface, a segmented ring having a mating conical inner periphery adapted to be seated in said indentation, said segments having half-lap joints at their meeting ends, joining pins extending through the mutually overlapping ends of said segments, a retaining ring secured to a radial face of said segmented ring having a peripheral flange overlying and closely embracing the outer periphery of said segments, and clamping bolts located about the periphery of said rings extend through said rings in an axial direction and are threaded into said segments and extend therebeyond.

4,012,155

SNAP LOCK CONNECTOR FOR COMPONENTS SUCH AS KNOCK-DOWN FURNITURE COMPONENTS

Max O. Morris, 582 E. Sunset Highway, Issaquah, Wash. 98027

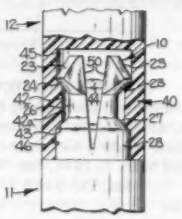
Filed May 2, 1975, Ser. No. 574,017
Int. Cl.² F16B *21/06*
U.S. Cl. 403—290 **7 Claims**

1. A snap lock connector for use in connecting and disconnecting components, such as furniture components, and being characterized by a rigid construction which provides longitudinal stabilization of the components in the locked condition by preventing relative longitudinal movement or pivoting between the components; said connector comprising:

an elongate male member for forming an extension from one of the components to be assembled and having a generally bulbous outer end defining opposing, curved, oppositely and outwardly extending, leading and trailing, camming surfaces generally around at least a portion of the circumference thereof, a longitudinally extending intermediate portion extending from said trailing surface and being of smaller transverse cross-sectional dimensions than said bulbous outer end, and a generally nonflexible rear end portion extending longitudinally from said intermediate portion and being of a predetermined configuration having cross-sectional dimensions at least as large as said bulbous outer end;

a female member for forming an elongate, internal passageway within the other of the components to be assembled and having an inner portion of slightly larger dimensions than said bulbous outer end of said male member, and inwardly and longitudinally extending projection forming an intermediate portion for restricting the dimensions of said passageway at said intermediate portion to less than the dimensions of said bulbous outer end of said male member, and a longitudinally extending generally nonflexible outer portion of slightly larger dimensions than said bulbous outer end of said male member, and being of a predetermined configuration corresponding generally to the predetermined configuration of said rear end portion of said male member for snuggly receiving same when said members are in locking engagement, said projection defining opposing, curved, oppositely and inwardly extending, leading and trailing, camming surfaces;

one of said male and female members comprising flexible, resilient material and having a longitudinal cut-out partially therethrough for rendering a portion other than said generally non-flexible portion of said one member expandable and contractable; and



said leading, camming surface of at least one of said male and female member comprising a lesser included angle with respect to a longitudinal axis than said trailing camming surface for locking of said members with less force than unlocking of said members;

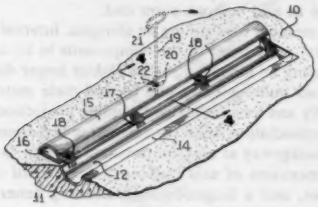
whereby, said male member may be inserted into and withdrawn from said female member for locking of said members by forced sliding engagement of said leading camming surfaces and for unlocking by forced sliding engagement of said trailing camming surfaces of said male and female members causing flexible contraction of said expandable and contractable portion of said one member for allowing passage of said bulbous outer end of said male member past said projection in said intermediate portion of said female member, and so that, when said male member is inserted into said female member and is in locking engagement therewith, said trailing camming surface of said male member will be in engagement with said trailing camming surface of said female member and said generally nonflexible rear end portion of said male member will be snuggly received in said generally non-flexible outer portion of said female member of generally the same configuration for providing a rigid connection with longitudinal stabilization of said male and female members to prevent relative movement or pivoting between said members and thus the components being connected.

4,012,156

RETRACTABLE SAFETY SPEED BUMP

William Turner, Box 1012, Walterboro, S.C. 29488, and John Heath Turner, 2305 Huntingdon Road, Huntingdon Valley, Pa. 19006

Filed Mar. 4, 1976, Ser. No. 664,040
Int. Cl.² E01F *11/00*
U.S. Cl. 404—15 8 Claims



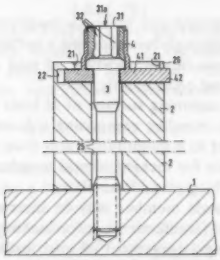
1. A retractable speed bump comprising a concave section adapted for mounting fixedly within a roadway recess and being upwardly open, and a complementally shaped movable section nestably engagable within said concave section and when in such position having a top plate portion substantially flush with the roadway surface within which the concave section is mounted, said movable section shiftable to an active speed bump forming position wherein the movable section is inverted and has said top plate portion disposed lowermost and resting on the roadway surface at one side of said roadway recess and said concave section.

4,012,157

CONNECTING DEVICE

Klaus Krause, Nurnberg, and Ludwig Ilgmeier, Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Mar. 1, 1976, Ser. No. 662,811
Int. Cl.² F16B *5/02*
U.S. Cl. 403—20 8 Claims



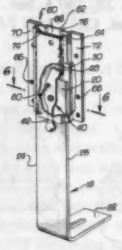
1. Device for connecting a first component to a second component, the first component being formed with a recess extending therethrough and comprising, serially and in communication with one another, an elongated recess portion of given diameter, a first shallow recess portion coaxial to and having a larger diameter than said elongated recess portion, part of said first shallow recess portion being an undercut of an end wall portion of the first component, and a second shallow recess portion eccentric to said first shallow recess portion and to said elongated recess portion, said first component being formed with a lateral groove at the location of and communicating with said shallow recess portions, a pin-shaped member having a shaft with a head at one end thereof and formed with a thread at the other end thereof, said shaft extending through said recess formed in the first component and being securable by the threaded end thereof in a correspondingly threaded bore formed in the second component so that said pin-shaped member by said head thereof engages the first component at one side of the latter and presses the first component at the opposite side thereof against the second component, and means for securing said pin-shaped member against rotation relative to the first component, said securing means comprising a cup-shaped member surrounding said head of said pin-shaped member and engageable with said head so as to be mutually fixed against relative rotation, said cup-shaped member having a disc-shaped base receivable in said undercut part of said first shallow recess portion and formed with a projection engageable in said lateral groove so as to secure said cup-shaped member and said pin-shaped member accordingly against rotation relative to the first component, said head being formed with means accessible from the free end surface thereof and engageable by a pin rotating device for rotating said pin-shaped member relative to said cup-shaped member so as to disengage said pin-shaped member from said cup-shaped member.

4,012,158

ADJUSTABLE SEAT-BACK MECHANISM

Henry J. Harper, 720 Greentree Road, Pacific Palisades, Calif. 90272

Filed Sept. 15, 1975, Ser. No. 613,629
Int. Cl.² F16B *7/14*; A47C *1/00*
U.S. Cl. 403—107 1 Claim



1. In an adjustable seat-back mechanism, the combination of:

a. an upright, flat mounting bar having horizontally spaced first and second upright edges;

b. said first edge of said mounting bar having vertically spaced teeth therein;

c. a tubular bracket on and movable vertically of said mounting bar and having horizontally spaced first and second, upright edges respectively adjacent said first and second edges of said mounting bar;

d. said first edge of said bracket having an opening therein adapted to register with said teeth on said first edge of said mounting bar;

e. a lever within said bracket and adjacent said mounting bar and having upper and lower ends and pivotally connected to an inner surface of said bracket intermediate the upper and lower ends of said lever;

f. said lever having at its upper end an element selectively engageable either with one of said teeth on said first edge of said mounting bar, or insertable into said opening in said first edge of said bracket to disengage said teeth;

g. a leaf spring for biasing said element into selected engagement with said teeth on said first edge of said mounting bar;

h. said lever having an inverted L-shaped recess therein receiving an upper end of said leaf spring and connecting said upper end of said leaf spring to said lever;

i. the lower end of said leaf spring being seated against said second edge of said bracket; and

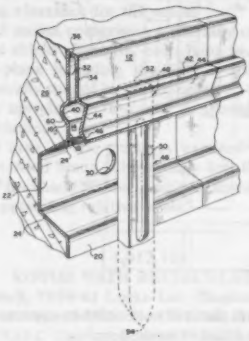
j. said lower end of said lever depending below the lower end of said bracket.

4,012,159

KEY-JOINT FORMING DIVIDER STRIP AND SCREED FOR USE WITH CONCRETE SLABS

Homer E. Berry, Parsons, Kans., assignor to Superior Concrete Accessories, Inc., Franklin Park, Ill.

Filed Mar. 22, 1976, Ser. No. 668,818
Int. Cl.² E01C *11/02*
U.S. Cl. 404—68 2 Claims



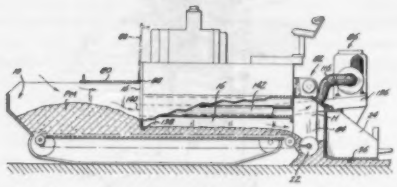
1. A forming unit adapted to establish a key-joint between a pair of adjacent concrete slabs and comprising, in combination, a plurality or horizontally aligned and spaced stakes having relatively thick upper ends and set with such ends uniformly below grade level, and a horizontally elongated divider strip formed of sheet material, supported on said stakes and bridging the distance between each pair of stakes, said divider strip having a lower key-joint forming section and an upper vertically extending screed section, said lower key-joint forming section having upper and lower vertical coplanar parts abutting against the adjacent sides of the stakes, and an intermediate laterally offset key deformation portion extending between and connecting said upper and lower coplanar parts, said vertically extending screed section being in the form of a hollow inverted U-shaped structure extending along the upper region of said divider strip and including a vertical inner wall portion which is connected to said upper part of the lower key-joint forming section, a vertical outer wall portion consisting of an upper component positioned in opposed and parallel relation with said inner wall portion and spaced from the latter a distance less than the thickness of the upper end of a stake, and a depending lower component, and a narrow planar horizontal top wall extending between the upper regions of said vertical inner and outer wall portions, connected thereto by sharp right angle bends, and constituting a screed surface of appreciable width, one of said vertical wall portions being formed directly beneath the inverted U-shaped structure with a right angle bend which establishes an outwardly extending seating and impact shoulder which bears against and is seated upon the upper ends of said stakes, the lower component of said outer vertical wall portion extending downwardly and inwardly in order to form beneath the level of said seating and impact shoulder a spring apron which yieldingly bears against the other sides of said stakes and serves to draw said upper and lower coplanar parts against the stakes, the lower edge region of said spring apron being turned outwardly and establishing a cam surface which, upon application of the divider strip to the stakes, serves to flex the apron outwardly so as to receive the upper ends of the stakes between said upper part of the lower key-joint section and the apron, said downwardly and inwardly extending spring apron and the out-turned lower edge region thereof being joined together by an inwardly extending apex portion which prior to application of the divider strip to the upper ends of the stakes is spaced from said upper part of the lower key-joint section a distance less than the thickness of said upper ends of the stakes.

4,012,160

PAVING MACHINE WITH ENCLOSED MATERIAL COMPARTMENT

Jimmy L. Parker, 19909 Filbert Drive, Bothell, Wash. 98011

Continuation-in-part of Ser. No. 452,056, March 18, 1974, Pat. No. 3,967,912. This application Apr. 19, 1976, Ser. No. 678,146
The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.
Int. Cl.² E01C *19/00*
U.S. Cl. 404—84 5 Claims



4. In a paving machine comprising a pair of endless feed conveyors arranged to deliver paving material rearwardly from a hopper to the inboard ends of a pair of transverse augers which spread the material outwardly and deposit it onto the surface being paved forwardly of a leveling screed which trails the augers, the improvement comprising:

a fixed height opening at the hopper to control the amount of paving material that is delivered from the hopper onto each feed conveyor;

a separate variable speed drive means for each feed conveyor, each of which is operatively connected to its feed conveyor;

control means for the feed conveyor drive means, including a separate sensor for each feed conveyor, each of which is mounted on the paving machine adjacent the discharge end of its feed conveyor and at the inboard end of the associated auger, for measuring changes in the level of the paving material deposited onto the surface below the sensor and producing a signal proportional to said changes, and means operatively connected to said sensor which is responsive to the signal indicating changes in the level of the paving material at the sensor, for proportionally and substantially instantaneously increasing the drive speed of the associated feed conveyor as the level drops and proportionally and substantially instantaneously decreasing the drive speed of such feed conveyor as the level rises;

a separate variable speed drive means for each auger, each of which is operatively connected to its feed conveyor;

control means for the auger drive means, including a separate sensor for each auger, each of which is mounted on the paving machine adjacent the outboard end of its auger for measuring changes in the level of the paving material deposited onto the surface below the sensor and producing a signal proportional to said changes, and means operatively connected to said sensor which is responsive to the signal indicating changes in the level of the paving material at the sensor, for proportionally and substantially instantaneously increasing the drive speed of the associated auger as the level drops and proportionally and substantially instantaneously decreasing the drive speed of such auger as the level rises, whereby the feed conveyors and the augers are continuously being independently and automatically driven at speed proportional to the demand for paving material at the discharge ends thereof;

wall means enclosing at least a substantial portion of the hopper, feed conveyor and augers; and

pollution control means on said machine for collecting pollutants from the enclosed regions.

4,012,161

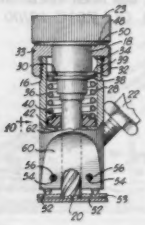
ROTARY CUTTING DEVICE

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Division of Ser. No. 470,165, May 15, 1974, abandoned. This application Nov. 4, 1975, Ser. No. 628,484

Int. Cl.² B23B *35/00*

U.S. Cl. 408—1 R **4 Claims**



1. A method of separating two pieces of metal joined by a spot-weld comprising:

disposing a cutting bit having a flat cutting end of a cutting instrument in position to overlie said spot-weld;

maintaining a cutting end of said cutting instrument in position over said spot-weld by engaging a first metal piece in a plurality of locations with a plurality of rigid conically pointed projections extending from said cutting end of the cutting instrument;

forcing said rigid points to extend into a surface of said first metal piece by applying a downward force on said cutting instrument near the cutting end of said cutting instrument;

forcing the cutting bit into engagement with the surface of said first piece of metal and into the spot welded portion of said first piece while said rigid points extend into said surface of said first metal piece;

cutting said first piece of metal to remove said spot welded portion of said first piece;

controlling the longitudinal depth of the cutting bit to cut substantially only the first piece of metal;

separating the pieces of metal.

4,012,162

ALL PURPOSE MAGNETIC BASE DRILL

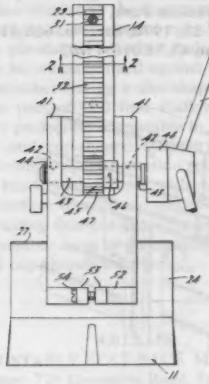
Wesley S. Warren, 4298 Chimney Pointe Drive, Bloomfield Hills, Mich. 48013

Filed Feb. 10, 1975, Ser. No. 548,423

Int. Cl.² B23B *45/14*

U.S. Cl. 408—76 **2 Claims**

2. In a portable drill press, a circular base having a central aperture, a column in said aperture extending upwardly from said base, means for securing the bottom of said column within said aperture, a sleeve substantially the diameter of said base secured thereabove in alignment therewith forming an area for elements to be carried therein, a motor bracket having a vertical central portion disposed along the side of said base and sleeve, an upper and lower portion at the top and bottom of the motor bracket extending therefrom in opposite direction and in unit relation therewith, said upper portion having aperture means which receives said column above said sleeve, a pinion carried by said upper portion, a rack having teeth on one side and a form on the opposite side which mates with a form on the column, said teeth engaged with the teeth of the pinion, a support on the lower portion of said bracket for supporting a drill unit, an annular recess extending within said base outwardly of said central aperture, a magnetic coil mounted in said recess to extend about the bottom of said column, the base being of the magnetic type for retaining the drill in place on magnetizable material, and a plate to which said magnetic base is securable, said plate having an extending end located beneath the drill in position to operate on a workpiece supported on said extending end.



4,012,163

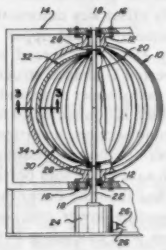
WIND DRIVEN POWER GENERATOR

Franklin W. Baumgartner, Denver, and John Michael Murphy, Littleton, both of Colo., assignors to Franklin W. Baumgartner, Denver, Colo., a part interest

Filed Sept. 8, 1975, Ser. No. 611,090

Int. Cl.² F03D *7/06*

U.S. Cl. 415—2 **10 Claims**



1. A wind driven power generator comprising:

a rotor including a rotor shaft mounted for rotation about an upright axis and a plurality of narrow elongate rotor blades secured to the shaft for rotation therewith;

each rotor blade extending throughout a substantial portion of the axial length of the rotor in a general radial plane including the axis of the rotor shaft and cooperating with the other blades to define a surface of revolution;

each blade having a cross sectional shape configured and arranged to present an outer surface, at least the major portion of which extends rearwardly and inwardly with respect to the surface of the rotor to be rotationally driven by contact of air flowing inwardly toward the center of the rotor;

wind controlling shield means surrounding the rotor and conformed to define a free flow air inlet area adjacent to the rotor blades which is substantially less than the maximum projected area of the shield means in a plane normal to the direction of the relative wind and serving to increase the velocity of the air flow contacting the rotor blades well above the velocity of the relative wind;

the shield means being operative to cause the high velocity

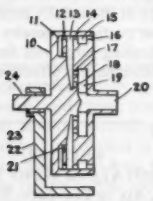
air flow to travel in a direction generally perpendicular to the axis of the rotor shaft;
a power transmitting axial extension of the rotor shaft extending outward of the shield means;
and power absorbing load means connected to the extension;
the shield means being in the general form of a surface of revolution conforming to the surface of revolution defined by the rotor and being sufficiently larger to provide running clearance for the rotor;
the shield means comprising a plurality of narrow elongate upright shield elements, each lying in a general upright radial plane including the axis of the rotor shaft and peripherally spaced to define between them a plurality of narrow upright free flow inlet air passages adjacent to the rotor blades;
the total area of the passages exposed to the prevailing relative wind being substantially less than the projected area of the shield means in a plane normal to the direction of the prevailing relative wind.

4,012,164

ROTOR WITH RECIRCULATION

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 501,064, Aug. 27, 1974, Pat. No. 3,939,661. This application Nov. 28, 1975, Ser. No. 636,310
Int. Cl.² F04D *5/00*
U.S. Cl. 415—53 R **5 Claims**



1. A rotor for pressurizing of a fluid and comprising:
a. a fluid entry to said rotor near the center of rotation of said rotor;
b. a set of fluid nozzles for passing said fluid and oriented to discharge said fluid forwardly in the direction of rotation;
c. a vortex cavity within said rotor to receive said fluid from said fluid nozzles; for pressurizing said fluid;
d. a fluid discharge means from said vortex cavity adapted for discharging the fluid that entered the rotor through said fluid entry;
e. a fluid recirculation means for recirculating a part of said fluid from said vortex cavity into fluid recirculation nozzles; with the fluid recirculation nozzles discharging said fluid forwardly into said vortex cavity in the direction of rotation; with the recirculation nozzles being located inwardly toward rotor center from the vortex cavity area where the fluid is taken from said cavity for recirculation.

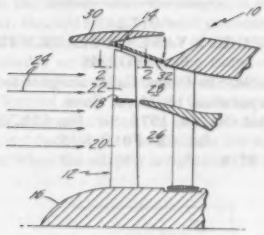
4,012,165

FAN STRUCTURE

Alfred Henry Kraig, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 8, 1975, Ser. No. 638,883
Int. Cl.² F01D *17/00*
U.S. Cl. 415—145 **3 Claims**

1. In a turbofan engine having a rotor which is mounted for rotation with respect to a stationary fan case, the improvement which comprises:
a plurality of circumferentially spaced fan blades extending radially from the rotor toward the fan case wherein each fan blade has
an inward region which is contoured for the conversion of dynamic energy within subsonic and low supersonic streams to pressure energy and
an outward region which is contoured for the conversion of dynamic energy within a high supersonic stream to pressure energy within a subsonic stream and wherein said contour of the outward region is adapted to form between each pair of adjacent blades
a convergent passage for the gradual deceleration of the supersonic stream and



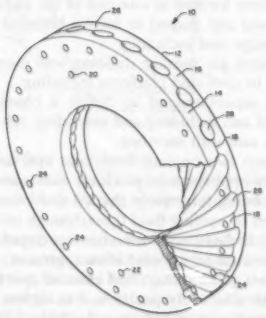
a throat downstream of the convergent passage for containment of a normal shock wave between adjacent blades;
a mid-span shroud positioned on each blade to separate said inward subsonic and low supersonic region from said outward high supersonic region; and
at least one starting and stabilizing door in said stationary case which is radially opposes the fan blade tips and which is moveable with respect thereto to vary the area of the convergent passage and of the throat for positioning the shock wave at the throat.

4,012,166

SUPERSONIC SHOCK WAVE COMPRESSOR DIFFUSER WITH CIRCULAR ARC CHANNELS

Merle L. Kaesser, Waterloo, Iowa, and Homer J. Wood, Sherman Oaks, Calif., assignors to Deere & Company, Moline, Ill.

Filed Dec. 4, 1974, Ser. No. 529,498
Int. Cl.² F04D *21/00, 29/44*
U.S. Cl. 415—181 **21 Claims**



1. A diffuser for use with a centrifugal compressor comprising first and second body halves mating along a central plane to define an annular diffuser body having a central axis, an inner circumference adapted for concentric disposition about the periphery of a centrifugal compressor in close proximity thereto, and an outer circumference, said diffuser body having a pluraliiy of curved diffusion channels defined therein which extend between the inner and outer circumference and which curve toward a direction of a tangential velocity component of

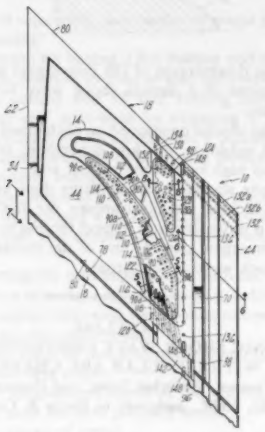
gases entering the diffuser channels at the inner circumference, the diffusion channels having a cross section perpendicular to a central longitudinal axis therealong which is at least generally circular and a divergence angle which increases with distance from the inner circumference without sharp transitions in the diffusion channel walls to provide each channel with a diameter that increases at an increasing rate as distance from the inner circumference increases, adjacent diffusion channels intersecting near the inner circumference along a sharp, generally elliptical edge which is in close proximity to the outer circumference of a centrifugal compressor.

4,012,167

TURBOMACHINERY VANE OR BLADE WITH COOLED PLATFORMS

Melvin Lee Noble, San Diego, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 14, 1975, Ser. No. 622,321
Int. Cl.² F01D *5/18*
U.S. Cl. 416—97 A **9 Claims**



1. A turbomachinery airfoil member adapted to be supported to extend across a heated gas passage in turbomachinery and having:

A. a platform located at one end of the airfoil member and positioned and shaped to form a boundary of the heated gas passage and including:

1. a heated gas passage defining wall member,

B. means to cool said platform including:

1. wall means shaped to define a chamber of shallow height and including and extending substantially parallel to said wall member,

2. at least two cooling fluid inlet apertures in said wall means opposite said platform wall member, said apertures being selectively shaped and oriented to direct a stream of cooling fluid therethrough to impinge against said platform wall member in response to pressure differential across said inlet apertures,

3. at least one cooling fluid exhaust aperture in said wall means selectively positioned to define a cooling fluid flow path across said chamber from said inlet apertures to said exhaust aperture, and

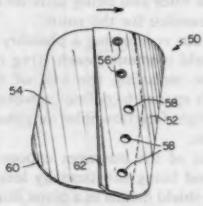
4. dam means extending across the height of said chamber adjacent said inlet apertures and being selectively shaped to cooperate with said wall means to define a cavity separate from but communicating with the cooling fluid flow path to protect the impingement jets of cooling fluid passing through said inlet apertures from cross-flow interference from the cooling fluid passing through the cooling fluid flow path until impingement against said platform wall member has occurred.

4,012,168

TWISTED FLEX FAN

Michael Thomas Spellman, Indianapolis, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,728
Int. Cl.² F04D *29/38*
U.S. Cl. 416—132 A **7 Claims**



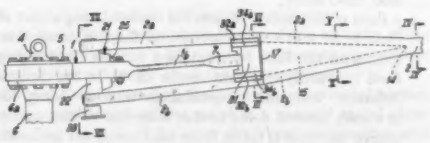
1. A fan blade construction adapted for use in an internal combustion engine and for a fan formed of resilient sheet material, said blade having the form of a cutout from a cylinder, with the longitudinal axis of a blade being at an angle greater than zero degrees but less than ninety degrees to the longitudinal axis of the cylinder, the improvement comprising, the blade having a leading edge portion which is stiffened and having a flexible trailing portion, the juncture of the said flexible portion and the said stiffened portion being substantially linear, the width of the flexible trailing portion measured from its trailing edge to its juncture with the leading edge portion being greater at its radially innermost portion than at its radially outermost portion, whereby under normal operating conditions the trailing edge will flex at higher fan blade speeds to thereby diminish the effective pitch of the blade at such speeds.

4,012,169

ROTOR FOR ROTATING WING TYPE AIRCRAFT

René Louis Mouille, Aix en Provence; René Louis Coffy, Marseille; Michel Aimé Hancart, Marignane, and Daniel Mao, Marseille, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Continuation-in-part of Ser. No. 469,045, May 10, 1974, Pat. No. 3,967,918. This application Mar. 22, 1976, Ser. No. 669,086
Claims priority, application France, May 10, 1973, 73.16887; Mar. 7, 1974, 74.07776; Mar. 26, 1975, 75.09504
Int. Cl.² B64C *27/38*
U.S. Cl. 416—134 A **7 Claims**



1. A rotor for a rotating-wing craft comprising a driving shaft, a flat star-shaped rotor hub made of resin-reinforced glass fibres and substantially extending in a plane perpendicular to said driving shaft, said rotor having a central part adapted for being secured to the end of said driving shaft and a plurality of flat arms extending each from said hub central part substantially along a radial axis in said plane, said hub central part and flat arms having, in the direction perpendicular to said plane, respective thickness of substantially different values so that said central part is rigid and said flat arms are flexible in said direction, a same plurality of rotor blades having each a fork-shaped root part, disposed in closed relationship to the outer end of one of said hub arms, and having two arms extending substantially along the radial axis of the

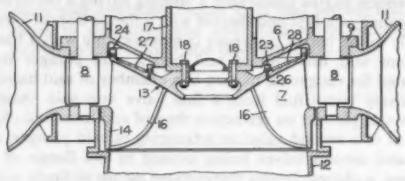
respective hub arm at a distance from the two faces of said flat arm respectively, first and second means for connecting the fork-shaped root part of each rotor blade to said hub central part and to the outer end of said hub arm respectively, said first and second connecting means being adapted for permitting resiliently limited rotations and sliding displacement of said blade root part around and along said radial axis in relation to said hub central part and arm, and said first connecting means being further adapted for transmitting centrifugal radial forces from said rotor blade directly to said rigid hub central part, whereby flapping movements of the rotor blades in said direction are permitted by the flexible hub flat arms and said connecting means.

4,012,170

FABRICATED CROWN PLATE FOR FRANCIS-TYPE HYDRAULIC TURBINE RUNNER

Robert G. Grubb, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 18, 1975, Ser. No. 605,755
Int. Cl.² F01D *5/14*
U.S. Cl. 416—186 R **1 Claim**



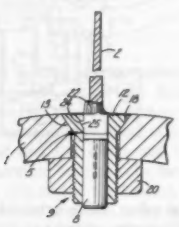
1. A turbine and pump runner having a crown and a band with a plurality of circumferentially spaced runner buckets connected therebetween, said crown comprising: an integrally formed inner circular section extending in a plane substantially transverse to the axis of rotation of the runner and forming a bucket mounting surface; at least two integrally formed arcuate outer sections rigidly connected to said inner section by a circular weldment and to one another and forming with said inner section a continuation of said bucket mounting surface; a plurality of runner buckets connected to said bucket mounting surface; and a runner seal ring connected to the surface of said crown opposite to said bucket mounting surface and being concentric with and overlying said circular weldment.

4,012,171

BLADE AND MOUNTING MEANS

Michael N. Suvak, 34900 Forest Lane, Solon, Ohio 44139

Filed Apr. 24, 1974, Ser. No. 463,570
Int. Cl.² F04D *29/36*
U.S. Cl. 416—207 **4 Claims**



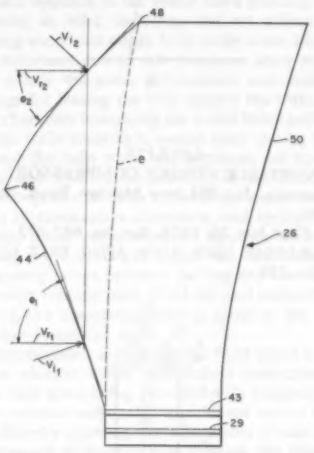
1. In blade and mounting means of the class described, in combination, a blade member, a shank thereon, a stem extending from the shank, an adapter to receive therein the stem and at least a portion of the shank aforesaid, said adapter including means to grip the stem and the shank portion upon application of pressure to the adapter, and instrumentalities including a nut to engage said adapter to apply such pressure when said adapter is mounted in a blade carrier, the adapter including a tubular body, having a head formed with a frusto-conical surface and a recess, threads are formed on the exterior of the body, a diametral slot extends across the adapter body in alignment with the recess, said slot extending axially along the adapter body, the nut is engaged with the threads, and the interior of the body is formed to receive the stem of the blade member to grip the same in the body as the nut is tightened on the threads when the adapter is in position on the blade carrier, the said shank enclosed portions conform to the frusto-conical surface on the head of the adapter, the blade member includes an edge extending outwardly beyond the shank aforesaid to overlie a surface of such blade carrier, a thin fin is formed integrally with the edge of the blade to extend from the same near the said shank, said fin being crushed against such surface as to cause the edge to be sealed there against when the adapter is tightened by manipulation of the nut.

4,012,172

LOW NOISE BLADES FOR AXIAL FLOW COMPRESSORS

Pierre G. Schwaar, Monroe, and John A. O'Connor, Orange, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Sept. 10, 1975, Ser. No. 612,220
Int. Cl.² F04D *29/38*
U.S. Cl. 416—228 **1 Claim**



1. In an axial flow compressor:

a rotor having a circumferential row of radially projecting blades, each blade having means at its hub end for attaching it to the rotor,

each blade being in the form of an airfoil having a progressively decreasing camber and progressively increasing angle of twist from its hub end to its tip end,

said rotor having a rate of rotation at which at least an outer portion of the blade has a velocity, relative to the air flow therepast, which is at a sonic value or greater, said relative velocity being sufficient to generate a shock wave on the leading blade edge disposed normal to the direction of relative airflow,

characterized in that

the profiles of each blade at the inner, or hub end, and at the outer or tip end of said outer portion are of conventional length,

the leading edge of said outer portion is swept forwardly from its hub end on a curve having a progressively de-

creasing slope relative to the direction of air flow, outwardly to a point of sweep reversal spaced inwardly from the tip end of the blade and, from said point of reversal, the leading edge is swept rearwardly to the tip end of the blade on a curve also having a progressively decreasing slope relative to the direction of air flow therepast, said slope at all points along the forwardly and rearwardly swepted portions of the leading edge being such that the flow velocity component normal thereto remains below a sonic value, and

the trailing edge of said outer portion of the blade is smoothly curved in a rearward direction from its hub end to its tip end, whereby the chord length of the blade profiles progressively become greater than conventional lengths outwardly to said point of sweep reversal and then the profile chord lengths progressively decrease to the conventional length profile at the tip end of the blade, and

further characterized in that

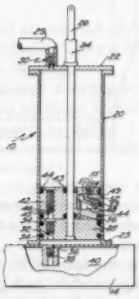
the point of curvature reversal is so disposed that the centers of gravity of the blades profiles progressively shift in one direction relative to the major and minor axis of inertia of the attachment means from the hub end of said outer portion to said point of sweep reversal and then shift in the opposite direction, relative to said axis of inertia, from the point of sweep reversal to the tip end, a distance such that a summation of the centrifugal bending moments is essentially balanced relative to the attachment means due to the straddling of the axis of inertia by the centers of gravity of the blade profiles.

4,012,173

VARIABLE STROKE COMPRESSOR

Kirke B. Everson, Jr., 394 New Meadow Road, Barrington, R.I. 02806

Filed Jan. 26, 1976, Ser. No. 652,473
Int. Cl.² F04B *19/00, 21/04, 39/10;* **F01B** *31/14*
U.S. Cl. 417—259 **4 Claims**



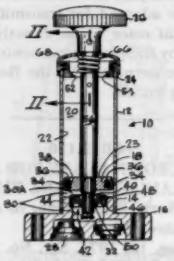
1. A compressor comprising a casing with substantially closed upper and lower ends, an inlet port adjacent the lower end and an outlet port adjacent the upper end, a piston rod passing through the upper end, a packing sealing the rod and upper end yet permitting reciprocation thereof, a lower piston coupled to the piston rod, an upper piston slidably disposed on the rod, check valves in the upper and lower pistons permitting upward flow, means acting on the upper piston to retard reciprocable downward movement thereof in said casing, said piston rod coupled to a source of energy to reciprocate the rod and said lower piston.

4,012,174

FUEL PRIMING PUMP

Jack N. Seibel, and Ronald C. Stump, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 20, 1975, Ser. No. 623,856
Int. Cl.² F04B *49/00, 21/02*
U.S. Cl. 417—307 **14 Claims**



1. In a manually activated fuel priming pump for an internal combustion engine comprising a housing having a barrel communicating at a first end thereof with a flange disposed transversely to the barrel, a plunger communicating with a handle adjacent said first end of said barrel, said plunger being mounted for reciprocal motion in a chamber of said barrel to selectively pump fuel from a first valve into said chamber below said plunger on retraction thereof and from said chamber out of a second valve on advancing of said plunger, said first and second valves being located in the flange of the housing, a plunger having therearound means slidingly sealing it with low friction against a bore defining said chamber, an improvement which comprises:

a member co-axial with said plunger and extending therefrom towards said flange; and

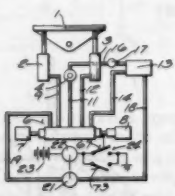
member-bore seal means slidably sealing said member to said bore and disposed intermediate said first and second valves and said plunger to allow flow of said fuel from said chamber below said plunger to said second valve and to sealingly retard flow of said fuel past said seal means in a reverse direction.

4,012,175

VALVE AND PUMP CONTROL FOR A HYDRAULIC SYSTEM

George D. Simonds, Jr., Mequon, Wis., assignor to Douglas Dynamics Corporation, Milwaukee, Wis.

Filed Dec. 31, 1975, Ser. No. 645,516
Int. Cl.² F04B *9/00*
U.S. Cl. 417—316 **11 Claims**



1. A combination valve, valve actuator and pump control for use in a hydraulic system wherein said valve is manipulated by said valve actuator to control flow in said hydraulic system and a pump is controlled by said pump control to produce flow in said hydraulic system and wherein

said valve includes

a body,

a valve member in said body movable between first, second and third positions,

means defining a plurality of flow ports in said body operatively associated with said valve member so that as said valve member assumes said first, second and third positions fluid flow circuits are established through said valve, and

shaft means connected to said valve member for transmitting movement to said valve means, said shaft means projecting exteriorly of said body;

said valve actuator including operating means engaging said shaft means and having first, second and third states of operation corresponding to said first, second and third valve member positions;

said pump control includes switch means in the circuit for said pump means to alternately activate and deactivate said pump means circuit;

and means connecting said operating means directly to said shaft means and including switch actuating means assuming positions relative to said switch means in accordance with whether said operating means is in said first, second or third states of operation, in said first state of operation said switch means deactivating the circuit to said pump means and activating the circuit to said pump means when said operating means is in said second and third states of operation and after said valve member has moved to said second and third positions.

4,012,176

FLUID-DRIVEN MOTOR AND FERTILIZER FEEDING DEVICE UTILIZING SAME

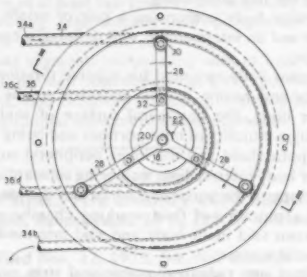
Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Feb. 21, 1975, Ser. No. 551,999

Claims priority, application Israel, Mar. 8, 1974, 44372

Int. Cl.² F04B *17/00*

U.S. Cl. 417—405 **10 Claims**



1. A fluid-driven feeding device comprising: a housing; a rotor rotatably mounted within the housing; a collapsible pressurized tube having a loop disposed within the housing, one end of the pressurized tube being connectable to a source of pressurized fluid and the other end being vented to the atmosphere; a collapsible feeding tube having a loop disposed within the housing, one end of the feeding tube being connectable to a source of fluid material to be fed therethrough and through the opposite end thereof; and pinch roller means carried by the rotor and engageable with said loops of both collapsible tubes whereby the pressurized fluid in the collapsible pressurized tube acts on the pinch roller means to rotate the rotor causing same as it rotates to collapse the feeding tube and thereby to feed the fluid material therethrough.

4,012,177

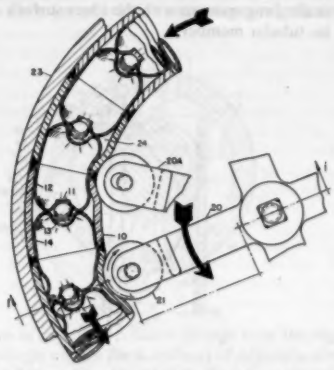
BLOOD PUMP TUBE ELEMENT

Sam S. Yakich, 2400 Wilkinson Blvd., Apt. 329, Charlotte, N.C. 28208

Filed Aug. 31, 1973, Ser. No. 393,568

Int. Cl.² F04B *43/08, 43/12*

U.S. Cl. 417—477 **1 Claim**



1. A Blood Pump Tube Element including:

A. a sequential plurality of resilient bag-like chambers wherein each chamber has one outlet comprising a single hole in the surface of the chamber and each chamber surface opposite to the outlet has a plurality of holes for forming an inlet; including resilient spherical balls for closing each said single hole outlet even when the balls are deformed due to side pressures since the chambers will follow the same deformation and metallic helical springs for biasing the balls against the walls of the bag-like chambers containing the outlet holes and for displacing the walls inwardly to secure more closing contact area around the balls when side pressures are applied to the balls; and wherein the plurality of said chambers being fused together so as to connect the outlet and inlet surfaces of consecutive chambers; said spring-biased balls, located inside cavities formed by chamber surfaces containing the consecutive outlet and inlet holes, acting as separating valves between the bag-like chambers,

B. an outer resilient tube about the said sequential plurality of bag-like chambers fused at spots to the plurality of bag-like chambers, and

C. rollers mounted at ends of arms fixed about a shaft driven by an electric motor; said rollers contacting the outer tube; said arms being provided with longitudinal slots to carry position-adjustable attachment means for the rollers, thereby enabling the adjustment of side pressure or the amount of fluid to pass through the bag-like chambers.

4,012,178

HYDRAULIC PUMP WITH REPLACEABLE PUMPING MEMBER

Benjamin V. Puckett, 13529 Charlwood Circle, Cerritos, Calif. 90701

Division of Ser. No. 351,461, April 16, 1973, Pat. No. 3,883,272. This application Feb. 25, 1975, Ser. No. 552,927

Int. Cl.² F04B *43/08, 45/06*

U.S. Cl. 417—478 **7 Claims**

1. A hydraulic pump comprising a casing and a pumping unit comprising:

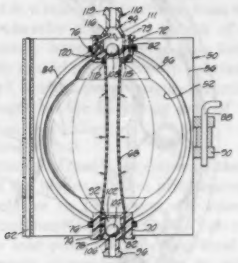
a. a fluid impermeable elastic tubular member;

b. a first and second pair of sealing rings sealingly connected to said elastic tubular member, each pair having:

1. an outer tubular ring surrounding a portion of the outer wall of said elastic tubular member, said outer tubular

ring including means for aligning and holding said sealing rings in said casing;

2. an inner tubular ring within said elastic tubular member and having an annular groove around the outer circumference of said inner tubular ring;
3. an O-ring within said annular grooves of said first and second inner tubular rings, said O-rings being in fluid sealing engagement with the inner surface of said elastic tubular member;



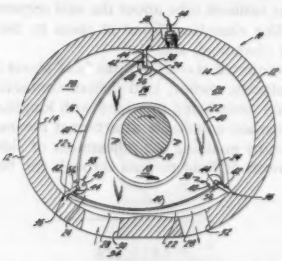
c. said first pair of sealing rings having an inlet valve within the inner tubular ring, and
d. said second pair of sealing rings having an outlet valve within the inner tubular ring, said elastic tubular member and said first and second pair of sealing rings defining a disposable unit which may be inserted in, or removed from the interior chamber of said casing which comprises means for creating alternately positive and negative pressure within the chamber to intermittently expand said elastic tubular member in said interior chamber.

4,012,179

SEALING GRID FOR A ROTARY PISTON MECHANISM

Thomas C. Roberts, Ridgewood, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 27, 1975, Ser. No. 562,806
Int. Cl.² F01C *19/04, 19/08*
U.S. Cl. 418—120 **5 Claims**



1. In a rotary piston mechanism having end walls spaced apart by a peripheral wall to define therebetween a housing cavity within which a rotor is supported for planetary rotation, the rotor having opposite side faces and peripheral surfaces intersecting each other to form apex portions and defining with the housing cavity a plurality of working chambers which successively expand and contract in volumetric size as the rotor planetates within said housing cavity, an improved sealing grid for substantially isolating the working chambers from each other, the sealing grid comprising:

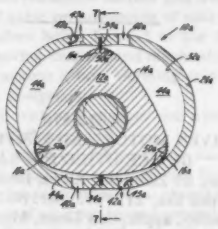
a. an apex seal assembly for each of the rotor apex portions;
b. each of said apex seal assemblies has a blade means supported in a radially extending apex groove in each of the apex portions of the rotor;
c. an apex seal pin for each apex portion carried in each side face and at each apex portion of the rotor;
d. a plurality of gas seal strips carried in each side face of the rotor;
e. each gas seal strip extending at one end in engagement with a blade means associated with one apex portion and out of contact with the apex seal pin associated with this blade means and to engagement with the apex seal pin associated with the next adjacent apex seal pin;
f. a first spring for each gas seal strip disposed in said rotor side faces to urge the associated gas seal strip toward and against the adjacent end wall; and
g. a biasing means for each gas seal strip, including a wedge element and a second spring, separate from each of the first springs, carried in each of the apex seal pins so as to engage one end of the associated gas seal strip and urge the latter endwise to thereby maintain the other end of the associated gas seal strip in engagement with the blade means associated with the next adjacent apex portion.

4,012,180

ROTARY COMPRESSOR WITH LABYRINTH SEALING

Murray Berkowitz, Woodcliff Lake, and George H. Woodier, Ringwood, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Dec. 8, 1975, Ser. No. 638,646
Int. Cl.² F01C *19/02*
U.S. Cl. 418—141 **10 Claims**



1. A rotary mechanism such as a compressor, expansion engine or the like comprising:

a. an outer body comprising a pair of axially-spaced end walls and an intermediate wall defining a cavity therebetween;
b. an inner body mounted for relative rotation within said cavity and having its axis eccentric to the axis of said outer body, the peripheral surface of said inner body having a plurality of nose portions and being substantially a hypotrochoid and the inner peripheral surface of said outer body intermediate wall being substantially the outer envelope of the peripheral surface of the inner body such that a plurality of fluid working chambers are formed between said inner body and said intermediate wall peripheral surface;
c. at least one radially-movable seal strip carried by said intermediate wall and disposed parallel to the axis of said mechanism at a position such that the inner edge of said strip substantially generates the hypotrochoidal peripheral surface of the inner body during relative rotation of said bodies and means for urging said seal strip radially inwardly into sealing engagement with said hypotrochoidal peripheral surface;
d. said outer body having intake and outlet ports for communication with said working chambers and disposed on opposite sides of said seal strip; and
e. at least one of said peripheral surfaces having labyrinth-type recesses over at least a portion of said surfaces to provide sealing cooperation between the nose portions of the inner body and said intermediate wall peripheral surface.

4,012,181
ENGINE WITH ROTOR, OF NEW TYPE

Andre Brulfert, 6, rue des Peintres Parrocel, and Andre Gabriel Hoss, 23 Boulevard Saint-Ruf, both of Avignon, Vaucluse, France (84000)

Continuation-in-part of Ser. No. 441,216, Feb. 11, 1974, Pat. No. 3,914,075. This application Aug. 4, 1975, Ser. No. 601,608

Claims priority, application France, Feb. 12, 1973, 73.04931; Feb. 20, 1973, 73.05946

Int. Cl.² F01C *19/08;* **F03C** *3/00;* **F04C** *15/00;* **F16J** *15/16*

U.S. Cl. 418—144 **10 Claims**

1. In a rotary engine having at least one rotor:

a stator for the rotor, said stator including a pair of end plates, a casing at least partially surrounding said rotor and joining said end plates at each end, and fluid admission and exhaust tubes;

rotatable means journaled in said end plates for displacing the rotor to form working chambers in the stator; and

a network of rectilinear grooves formed on the internal surfaces of said casing and said end plates and rectilinear segments mounted in each of said grooves sized smaller than the grooves for both lateral and longitudinal movement therein, said network including:

a. groups of at least two grooves and segments each across said casing radially arranged with respect to said rotatable means;

b. groups of at least two grooves and segments each polygonally arranged around said rotatable means in said end plates and

c. groups of at least two grooves and segments each interconnecting said radially and polygonally arranged groups of grooves and segments;

each of said segments cooperating with at least one other segment through interacting cut-away portions of the segments, said cut-away portions permitting both lateral and longitudinal movement of the segments.

4,012,182
MACHINES FOR ENERGY CONVERSION

Gösta Svensson, Sandelsgatan 23 B, 115 33 Stockholm, Sweden

Filed Nov. 12, 1975, Ser. No. 631,406

Claims priority, application Sweden, Nov. 26, 1974, 7414821

Int. Cl.² F04C *1/00*

U.S. Cl. 418—153 **11 Claims**

1. In a machine for energy conversion which includes two relatively movable parts defining a working chamber provided with inlets and outlets for a working medium, and in which both of said parts have members extending into said working chamber and serving as pistons and abutments respectively, said members being arranged to sealingly engage wall portions of the opposed and cooperating parts defining the working chamber, and at least said member or members of said one part are operative to permit passage of the member or members of the other part by being displaced transversely of the direction of relative movement, thus reducing its transverse area, the improvement that both of said members of said two relatively movable parts extend into the working chamber, divide the same and sealingly engage the wall portions defining said chamber, said members each include a number of juxtaposed elements engaging each other and/or the wall portions of the chamber in a sealing fashion, wherein each of said elements includes a pair of thin plate portions of resilient material engaging each other along at least one edge transverse to the direction of relative movement and wherein said

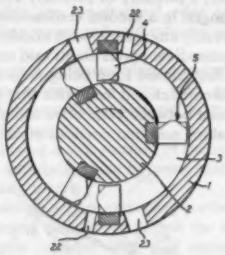


plate portions in un-biased position diverge from the engaging edge and sealingly engage flank surfaces of adjoining elements of same member and/or chamber wall portion facing such flank surface, and in biased position, upon meeting cooperating elements of said member of the opposed part, being flexed towards each other, thus allowing the likewise flexed plate portions of said elements of said opposed part member to pass through.

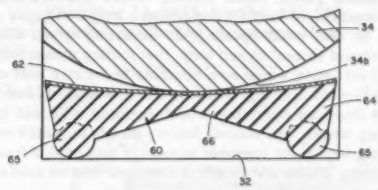
4,012,183
ROTARY VANE COMPRESSOR WITH VANE EXTENSION MEANS

Peter Trent Calabretta, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 9, 1975, Ser. No. 639,030

Int. Cl.² F01C *1/00;* **F04C** *17/00;* **F16F** *3/10*

U.S. Cl. 418—238 **3 Claims**



1. In a rotary compressor of the type including a cylindrical rotor having a plurality of extensible vanes received in complementary vane slots, the improvement comprising: means defining a convex edge on the radially inner portion of said vanes, and a resilient element engageable with said convex edge, said resilient element comprising a metal spring member and an elastomeric member bonded thereto having an intermediate section normally spaced from the bottom of said vane slots and adapted to flex downwardly upon engagement by said vane, said resilient element being sufficiently rigid to prevent collapse thereof in response to increased centrifugal forces.

4,012,184
FORTUNE COOKIE MACHINE

Kwok Chuen Ma, 144 Hester St., New York, N.Y. 10013

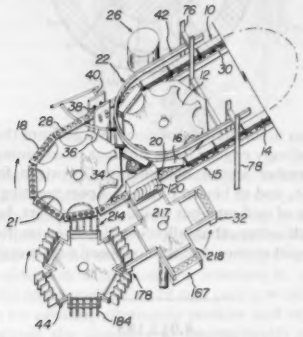
Filed May 21, 1975, Ser. No. 579,346

Int. Cl.² B29D *23/03*

U.S. Cl. 425—112 **9 Claims**

1. Fortune cookie making apparatus comprising a plurality of pivotally connected carriers arranged in a first endless

closed loop, first drive means operable engageable with said carriers to move the carriers about said first closed loop, each of said carriers comprising a bottom plate and a top plate, means pivotally mounting said top plate on said bottom plate to provide for raising of said top plate relative to said bottom plate, engageable means on said carrier, lift means disposed along a section of said first closed loop and being operably engaged by said lift means to raise said top plate relative to said bottom plate, a plurality of pivotally connected intermediate plates arranged in a second endless closed loop, second drive means operably engageably with said intermediate plates to move the intermediate plates about said second loop, a first portion of said first closed loop being coincident with a first portion of said second closed loop such that said intermediate plates are disposed between respective top and bottom plates of said carriers along said first portions of said first and second



closed loops, said second closed loop having a second portion defining a path of travel for said intermediate plates which is different from the path of travel of said carriers about said first closed loop, said intermediate plates having mold openings for receiving dough, feeding means fixedly disposed adjacent said second loop for feeding dough to said mold openings in said intermediate plates, paper feeding means disposed adjacent said second closed loop for depositing a length of paper on the cookie in said mold opening, an actuating wheel disposed adjacent said second closed loop, first folding means mounted on said actuating wheel and operable to receive said cookie from said mold openings and fold the cookie along two parallel fold lines, an operating wheel disposed adjacent to said actuating wheel, and second folding means mounted on said operating wheel and operable to receive said cookie from said first folding means and to effect a second fold on said cookie to thereby form a fortune cookie.

4,012,185

CONFECTION MAKING MACHINE

William M. Poore, Huntington Beach, and Herbert W. Heckendorf, Upland, both of Calif., assignors to Frosty-Bite Confections, Huntington Beach, Calif.

Filed Jan. 8, 1973, Ser. No. 322,084
Int. Cl.[2] A23G 9/08, 9/28
U.S. Cl. 425—120 **16 Claims**

1. A machine for making a confection including an open top container and ice fragments, said machine comprising:

a supporting structure;

a conveyor mounted for movement on said supporting structure, said conveyor including a plurality of container mounts;

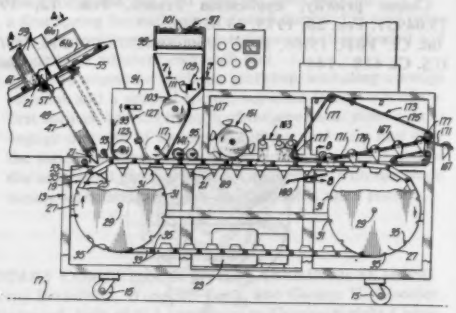
means for moving said conveyor so that said container mounts are moved through a plurality of stations;

first and second dams mounted on said supporting structure adjacent said conveyor, said dams being spaced from each other so that said conveyor conveys the containers from the first dam to the second dam;

means for delivering ice fragments to a location intermediate said dams;

first means for moving the ice fragments from said location toward said first dam;

each of said container mounts being adapted to hold one of the containers so that ice fragments can be deposited in



the containers from above while such container is intermediate said dams;

compacting means intermediate said dams for compacting ice fragments in the containers between said dams; and

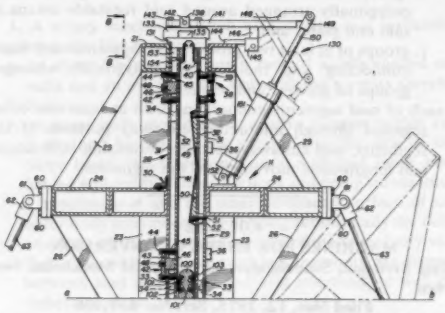
shaping means for shaping at least an outer portion of the ice fragments in the containers, said conveyor moving the containers from the second dam to the shaping means.

4,012,186

PANEL FORMING DEVICE

Dario J. Ramazzotti, Tallmadge; Geza A. Thiry, Ravenna, and James Genis, Clinton, all of Ohio, assignors to McNeil Corporation, Akron, Ohio

Filed Mar. 19, 1975, Ser. No. 560,094
Int. Cl.[2] B29D 27/04
U.S. Cl. 425—123 **25 Claims**

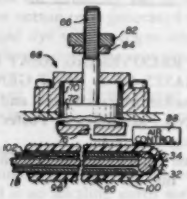


1. Apparatus for making panels having two sidewall forming skins and an insulation material therebetween comprising two mold platens, means selectively swinging each said mold platen about a common axis from an open position for loading the skins and unloading the panels to a closed position for receiving the insulation material, means selectively holding a skin on each said mold platen, core means extendable between said mold platens to close one end of the panel, nozzle means making multiple passes between the skins to dispense the insulation material between the skins, the first of said multiple passes dispensing the insulation material on said core means, and lid means activated during the last pass of said nozzle means to close the other end of the panel and to thereby form with the skins and said core means an enclosed cavity for the insulation material.

4,012,187
INJECTION BLOW MOLDING WITH PRELIMINARY INJECTION BLOW MOLD

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Green Brook, N.J.

Continuation of Ser. No. 518,185, Oct. 25, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,108
Int. Cl.² B29C 17/07
U.S. Cl. 425—242 B 6 Claims

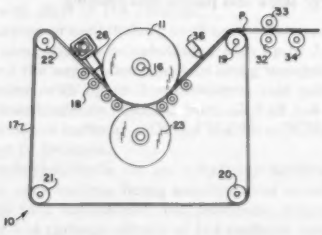


1. Injection blow molding apparatus including an injection mold, a blowing mold, core rods to which a parison is applied in the injection mold, a core rod indexing support movable to transfer the core rods from the injection mold to the blowing mold, each of the core rods having a valve operable to control flow of air from within the core rod to the inside surface of the parison to blow the parison, means for operating the core rod valves when the core rods are located in the blowing mold, and means for operating the core rod valves when the core rods are in the injection mold so as to partially expand the parison into contact with the injection mold and spaced from the core rod, means operable to suck back thermoplastic from the injection mold after injection molding, and said means for operating the core rod valves at the injection mold provides air to the inside of the parison after said means to suck back thermoplastic material from the injection mold is actuated so that a negative pressure is applied to the outside of the parison, and a positive pressure is applied to the inside of the parison in the injection mold to provide the partially expanded parison, whereby said indexing support is operable to transfer the partially expanded parison from the injection mold to the blowing mold for final blowing.

4,012,188
PRESSURE FORMING APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 170,625, Aug. 10, 1971, which is a continuation-in-part of Ser. No. 813,804, March 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 501,174, Oct. 22, 1965, abandoned, which is a continuation-in-part of Ser. No. 393,292, Aug. 31, 1964, abandoned, and Ser. No. 559,232, Jan. 16, 1956, abandoned. This application June 16, 1975, Ser. No. 587,532
Int. Cl.² B29C 15/00
U.S. Cl. 425—373 8 Claims

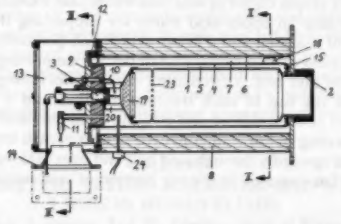


1. An apparatus for molding comprising:
a first molding member including a cylindrical drum,
means for rotationally supporting said drum for rotation about its longitudinal axis,
means for power rotating said drum,
a second molding means having a cylindrical surface conforming to the cylindrical surface of said drum,
means for supporting said second molding means with said cylindrical surface thereof disposed a distance away from a substantial portion of the cylindrical surface of said drum to provide an annular volume between said second molding means and said cylindrical surface of said drum, and
means for sealing the longitudinal edge portions of said second molding means and said cylindrical surface of said drum,
means for injecting a thermoplastic material in a plastic condition under pressure into said annular volume wherein said thermoplastic material is made to conform to said annular volume,
means for solidifying a first portion of the material injected between the annular surface between said drum and said second molding means,
said second molding means extending partially around said drum a sufficient distance to permit the molten thermoplastic material injected into said annular volume to solidify within said annular volume between said second molding means and said drum,
means for retaining said molten thermoplastic material within said annular volume and preventing the flow of said molten material laterally outwardly from said annular volume as it is injected therein by said injection means until it is at least solidified therein, and
means located beyond the end of said second molding means and the annular volume defined by said second molding means and the cylindrical surface of said drum for guiding the solidified shape formed of said thermoplastic material in said annular volume away from said drum.

4,012,189
HOT GAS GENERATOR

Alfred Vogt, Schaan, Liechtenstein, and Hans Mueller, Wartau-Weite, Switzerland, assignors to Interliz Anstalt, Vaduz, Liechtenstein

Filed Nov. 13, 1975, Ser. No. 631,545
Claims priority, application Germany, Dec. 7, 1974, 2457963
Int. Cl.² F23D 15/02
U.S. Cl. 431—353 6 Claims



1. A hot gas generator for the production of hot combustion gases from liquid fuel comprising a cylindrical combustion chamber, an inner air-feed cylinder concentrically disposed about said cylindrical combustion chamber, an inner air conduit between said cylindrical combustion chamber and said inner air-feed cylinder, an outer air-feed cylinder concentrically disposed about said inner air-feed cylinder, an outer air conduit between said inner and outer air-feed cylinders, fuel nozzle means arranged at one longitudinal end of said cylindrical combustion chamber, an exhaust port arranged at the opposite longitudinal end of said cylindrical combustion chamber, said inner and outer air conduits communicating with one another at the exhaust end of said cylindrical com-

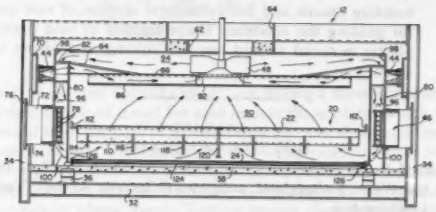
bustion chamber, guide means disposed on one longitudinal end of said inner air-feed cylinder for imparting a rotary motion to the air passing into said inner air-feed cylinder from said outer air-feed cylinder, said inner air conduit and the inside of said cylindrical combustion chamber communicating with one another at the end of the cylindrical combustion chamber on which the fuel nozzle means is arranged, said outer air conduit receiving combustion air from a blower or the like, a baffle plate disposed on the longitudinal end of said cylindrical combustion chamber on which the fuel nozzle means is arranged, said baffle plate having a central opening for the introduction of fuel from said fuel nozzle means, said baffle plate having a plurality of opening means for combustion air to pass from said inner air conduit to the inside of said cylindrical combustion chamber, said opening means imparting a rotary motion to the air passing into said cylindrical combustion chamber, said latter rotary motion being imparted to the air relative to the longitudinal axis of said cylindrical combustion chamber.

4,012,190

ANNEALING LEHR

Charles E. Dicks, Uniontown, and Clifford O. Burton, Perryopolis, both of Pa., assignors to E. W. Bowman Incorporated, Uniontown, Pa.

Filed Sept. 15, 1975, Ser. No. 613,203
Int. Cl.[2] F27B *9/00*
U.S. Cl. 432 **16 Claims**



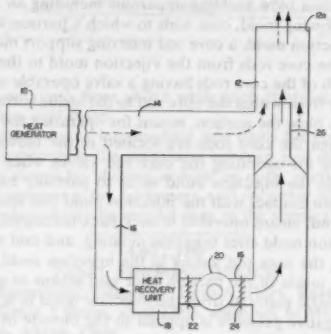
1. An annealing lehr comprised of a plurality of heating section serially arranged to form a continuous treating chamber through which the ware passes during the annealing operation; an endless foraminous conveyor belt for supporting the ware to be annealed, and means for supporting both the charging and return flights of said belt within said treating chamber, comprising an upper skid frame for supporting the charging flight of said belt and a lower skid frame positioned adjacent the bottom of said treating chamber for supporting the return flight of said belt; a circulating chamber including a top portion at the top of each treating chamber and a down duct portion at each side of said treating chamber, said down duct terminating below said conveyor belt to permit treating gases to pass upwardly through said belt and over said ware; a circulating fan mounted in the top portion of said circulting chamber and communicating with the top of said treating chamber for recirculating the treating gases which have passed over said ware, and electrical heating means mounted in and spaced from the walls of said down ducts at each side of the lehr generally laterally adjacent the charging flight of said conveyor, said treating gases circulated by said fan passing downwardly through said down ducts, over said electrical heating means and upwardly through said conveyor and over said ware supported thereon.

4,012,191

SYSTEM FOR RECOVERING HEAT FROM THE EXHAUST GASES OF A HEAT GENERATOR

Jerome Richard Lisankie, Morris Plains, and George Kratsios, Verona, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed June 18, 1975, Ser. No. 588,076
Int. Cl.[2] F28F *1/10*
U.S. Cl. 432—179 **4 Claims**



1. A system for recovering heat from the exhaust gases of a heat generator, comprising a discharge stack, first conduit means connecting said heat generator to said discharge stack, fan means to force said gases from said heat generator through said first conduit means to said discharge stack, a heat recovery unit connected to said first conduit means for removing heat from said gases before passage to said discharge stack, an inlet opening formed in said discharge stack at a location downstream from the connection between said first conduit means and said discharge stack, second conduit means connected to said heat generator and to said opening for providing an unobstructed direct passage between said heat generator and said discharge stack, and an inner stack disposed in said discharge stack and extending for the length of said opening in a spaced relation thereto for isolating the gases from said first conduit means from the gases from said second conduit means during the flow of said gases through said discharge stack and passed said opening.

4,012,192

OXIDATION OF VAT OR SULFUR DYES WITH VANADATE ACTIVATED BROMATE OR IODATE

Richard L. Doerr, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 468,703, May 10, 1974, Pat. No. 3,944,382. This application Nov. 24, 1975, Ser. No. 634,795

Int. Cl.² C09B 9/00

U.S. Cl. 8—34 5 Claims

1. In a process for oxidizing vat or sulfur dyes present in reduced form on cotton or regenerated cellulose textile fibers by contacting said dye with an aqueous oxidant solution, the improvement wherein said aqueous oxidant solution consists essentially of

a. 0.01–10% of an oxidizing agent comprising an alkali metal, alkaline earth metal or ammonium bromate or iodate and

b. 0.005 to 5% by weight of an alkali metal, alkaline earth metal or ammonium vanadate and wherein at least one of (a) and (b) is an alkaline earth metal,

c. the remainder water.

4,012,193

BISAZOMETHINE DYES FOR METAL-MODIFIED POLYOLEFINS

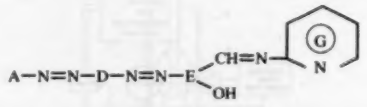
Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Sept. 2, 1975, Ser. No. 609,682

Int. Cl.² C09B 31/14, 45/48

U.S. Cl. 8—42 D 10 Claims

1. A bisazomethine dye of the formula



wherein:

A is a benzene or naphthalene nucleus, the benzene nucleus being unsubstituted or substituted with up to 3 substituents and the naphthalene nucleus being unsubstituted or substituted with up to 2 substituents, said substituents being independently selected from alkyl of 1–4 carbons; alkoxyl of 1–4 carbons; nitro; cyano; fluorine;; chlorine; bromine; trifluoromethyl; hydroxyl; RCOO—, where R is alkyl of 1–4 carbons; carboxyl; ROOC—, where R is alkyl of 1–4 carbons; RCO—, where R is alkyl of 1–4 carbons; benzoyl; RCONH—, where R is alkyl of 1–4 carbons; ArCONH—, where Ar is phenyl; or carbamyl, the nitrogen of which is unsubstituted or singly or doubly substituted with alkyl of 1–4 carbons;

D is a benzene or naphthalene nucleus, the benzene nucleus being unsubstituted or substituted with up to 2 substituents and the naphthalene nucleus being unsubstituted or substituted with up to 2 substituents, said substituents being independently selected from alkyl of 1–4 carbons; alkoxyl of 1–4 carbons; —OCH_2CH_2OH; —OCH_2CH_2CN; chlorine or bromine;

E is a salicylaldehyde or an o-hydroxy-naphthaldehyde nucleus each nucleus being unsubstituted or substituted with up to 2 substituents independently selected from alkyl of 1–4 carbons; alkoxy of 1–4 carbons; cyano; fluorine; chlorine or bromine; and

G is a 2-aminopyridine nucleus which is unsubstituted or substituted with up to 2 substituents independently selected from alkyl of 1–4 carbons; alkoxyl of 1–4 carbons; nitro; chlorine or bromine.

4,012,194

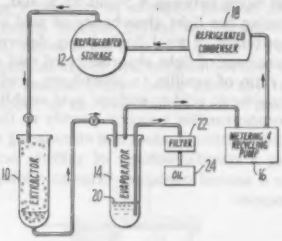
EXTRACTION AND CLEANING PROCESSES

Raymond L. Maffei, 639 Front St., San Francisco, Calif. 94111

Continuation of Ser. No. 186,089, Oct. 4, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 384,908

Int. Cl.² D06L 1/02

U.S. Cl. 8—142 1 Claim



1. A garment cleaning process consisting essentially of passing liquid carbon dioxide through garments to be cleaned by placing the garments within a closed container and admitting liquid carbon dioxide into the container from a refrigerated storage container, transferring the liquid carbon dioxide from the container to an evaporator, removing the dissolved garment soil material from the carbon dioxide by converting the liquid carbon dioxide to gaseous carbon dioxide in the evaporator, collecting the garment soil material in the evaporator and discarding it, and transferring carbon dioxide from the evaporator to a refrigerated condenser and then to the refrigerated storage container.

4,012,195

CATALYZED HYDRAZINE COMPOUND CORROSION INHIBITING COMPOSITION AND USE

Manfred G. Noack, Northford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 21, 1975, Ser. No. 606,550

Int. Cl.² C23F 11/00, 11/12, 11/14

U.S. Cl. 21—2.7 R 24 Claims

1. A composition, comprising:

a. a hydrazine compound; and

b. about 0.002 parts to about 0.04 parts by weight of an organo metallic complex per part of hydrazine compound, said organometallic complex being the reaction product of: (i) an inorganic salt selected from the group consisting of salts of cobalt, manganese and copper; and (ii) one or more organic ligands selected from the group consisting of unsubstituted and substituted orthodiamino aromatic compounds, unsubstituted and substituted orthodihydroxy aromatic compounds and unsubstituted and substituted orthoaminohydroxy aromatic compounds.

4,012,196

COLORIMETRIC METHOD FOR DETERMINING TOTAL LIPIDS IN HUMAN FLUIDS

Christopher S. Frings; Ted W. Fendley, both of Birmingham, Ala., and Ralph T. Dunn, Tampa, Fla., assignors to Damon Corporation, Needham Heights, Mass.

Continuation of Ser. No. 372,267, June 21, 1973, abandoned. This application May 19, 1975, Ser. No. 578,726

Int. Cl.² G01N 33/16, 21/02

U.S. Cl. 23—230 B 8 Claims

1. A process for determining total lipid concentration in an animal fluid containing at least 1 mg. lipids per ml. which comprises:

a. reacting a sample of the animal fluid with sulfuric acid in a container;

b. subsequently adding directly to the animal fluid-sulfuric acid reaction product in said container, a phospho-vanillin reagent comprising—

an aqueous solution of vanillin and phosphoric acid having a mole ratio of vanillin to phosphoric acid between 1.12×10^{-3} and 2.08×10^{-3} to form a chromogen without transferring a specific volume of the sulfuric acid-animal fluid mixture to a second container prior to adding the phospho-vanillin reagent, the mole ratio of phosphoric acid to sulfuric acid added to the animal fluid being between 9.5 and 55.5; and,

c. measuring the light absorbence of said chromogen, the concentration of total lipids being determined from the measurement of light absorbence of said chromogen,

said mole ratio of vanillin to phosphoric acid and said mole ratio of phosphoric acid to sulfuric acid enabling the addition of the phospho-vanillin reagent directly to the animal fluid-sulfuric acid reaction product and eliminating the necessity of transferring a specific volume of sulfuric acid-animal fluid mixture to a second container prior to adding the phospho-vanillin reagent.

4,012,197

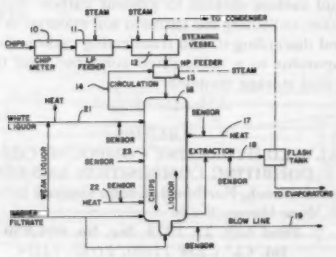
TITRATION APPARATUS AND METHOD THEREFOR

John J. Howarth, Monte Sereno, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Nov. 7, 1975, Ser. No. 629,859

Int. Cl.² G01N *31/16*; D21C *3/24*

U.S. Cl. 23—230 A **14 Claims**



13. A method for the on-line measurement of the concentration of an analyte in a container within a reaction system having severe ambient conditions and having a sample vessel suspended inside said containmer from a wall comprising the following steps: trapping said analyte in said sample vessel; thereafter injecting a titrant into said sample vessel; isolating from said sample vessel from the other analyte in said reaction system during said titrant injection; and sensing an abrupt change in conductivity of said analyte in said sample vessel during injection of said titrant; and purging said sample vessel.

4,012,198

IMMUNODIFFUSION DEVICE

Norman Boyne Finter, Sevenoaks; Leonard William Jerome Bishop, Beaconsfield, and June Dalziel Almeida, London, all of England, assignors to Burroughs Wellcome Co., Raleigh, N.C.

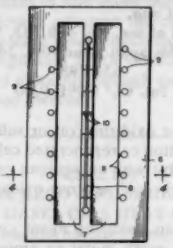
Continuation of Ser. No. 381,228, July 20, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,692

Claims priority, application United Kingdom, July 25, 1972, 34643/72

Int. Cl.² G01N *31/02*

U.S. Cl. 23—253 R **1 Claim**

1. A device suitable for use in carrying out immunodiffusion comprising a container having a base wall and side walls, said walls defining therebetween two parallel troughs for accommodating a substrate, a slit in the body of the container extending between said two troughs, a plurality of channels extending from said slit to said troughs, and a plurality of wells and conduits located in the side walls of said container corresponding to each of said channels whereby a immunological reagent placed in said slit would diffuse into a substrate located in each of said troughs via a channel and combine in said



substrate with an homologus immunological reagent having diffused into said substrate from corresponding conduit and well.

4,012,199

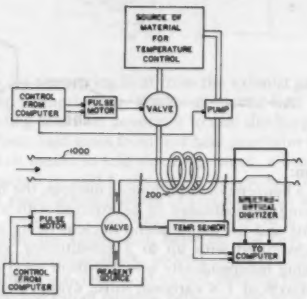
CHEMICAL REACTION AND PRODUCTION SYSTEMS WITH A SPECTRO-OPTICAL DIGITIZER

Paul P. Luger, Spokane, Wash., assignor to The Pioneer Educational Society, Portland, Oreg.

Continuation-in-part of Ser. Nos. 32,578, April 28, 1970, Pat. No. 3,875,410, and Ser. No. 238,574, March 27, 1972, Pat. No. 3,999,063, and Ser. No. 404,180, April 9, 1972, Pat. No. 3,998,644, and Ser. No. 563,158, March 28, 1975. This application Sept. 4, 1975, Ser. No. 610,190

Int. Cl.² G01D *5/34*; G01N *21/28*

U.S. Cl. 23—253 A **26 Claims**



1. In a chemical, reaction production system,

a. reagent material,

b. a reaction product A at a molecular concentration to be measured and controlled,

c. a sensing device called a spectro-optical digitizer comprised of:

1. a first source of electromagnetic flux,
2. a phototube-amplifier arrangement,
3. the cathode of said phototube-amplifier arranged to receive spectral lines produced by said first source of electromagnetic flux in said chemical reaction production system due to the presence of said reaction product A in said reagent material.
4. a variable speed motor driven by the output signal from said phototube-amplifier arrangement,
5. a light chopper comprised of the following: a mask containing an optical aperture, an arm carried on a rotating shaft, a second source of electromagnetic flux, a phototransducer assemblage arranged to be illuminated by said optical aperture, which said optical aperture is illuminated by said second source of electromagnetic flux,

6. said variable speed motor being connected to drive said rotating shaft,
7. said rotating arm so arranged to impede said second source of electromagnetic flux from reaching said optical-aperture, during a portion of the path of motion of said arm, thus generating a signal in said phototransducer,
8. a counter-timer arrangement connected to said phototransducer assemblage to produce time interval value measurements between said signals or groups of signals,

d. said first source of electromagnetic flux and said phototube-amplifier arrangement of said sensing device being so arranged in respect to said chemical reaction production system as to be responsive to change in said molecular concentration of said reaction product A.
e. a control device for said chemical reaction production system capable of changing said molecular concentration,
f. a linkage between said sensing device and said control device capable of maintaining control over said control device responsive to said time interval value measurements obtained from said sensing device.

4,012,200
APPARATUS FOR REMOVING LIQUID FROM THE INSIDE OF A TEST TUBE

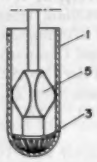
Jan de Leeuw, Akersberga, Sweden, assignor to AutoChem Instrument Aktiebolag, Bromma, Sweden

Filed Feb. 12, 1976, Ser. No. 657,690

Claims priority, application Sweden, Feb. 24, 1975, 7502005

Int. Cl.² B01L *11/00*; **B08B** *5/04*, *9/00*

U.S. Cl. 23—259 **3 Claims**



1. Apparatus for removing liquid from the inside of a test tube, the apparatus comprising an evacuation tube connected to a vaccum source and means connected to the evacuation tube having a diameter greater than the outer diameter of the evacuation tube, characterized in that said means is constituted by an elastic plate arranged at the end of the tube, the plate having a diameter slightly smaller than the inner diameter of the test tube, a centering means arranged on the evacuation tube to provide a uniform annular slot between the plate and the inner wall of the test tube, the lower side of the plate being provided with radial grooves, the elasticity of the plate being such that when pressed against the bottom of a test tube the grooves and the bottom of the test tube will form channels in communication with the evacuation tube.

4,012,201
REACTOR

Stanley Powell, Stockton-on-Tees, and Glyn Thomas, Middlesbrough, both of England, assignors to Tioxide Group Limited, Billingham, England

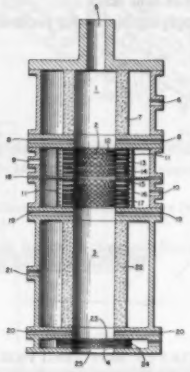
Division of Ser. No. 441,941, Feb. 13, 1974. This application Oct. 23, 1974, Ser. No. 517,394

Claims priority, application United Kingdom, Mar. 22, 1973, 13752/73

Int. Cl.² C01G *23/04*; **B05B** *11/14*; **F23D** *11/12*

U.S. Cl. 23—277 R **16 Claims**

1. In a reactor suitable for reacting a metal halide vapor and an oxidizing gas at an elevated temperature to produce the corresponding metal oxide, said reactor comprising an inlet port at one end of said reactor for introducing hot gas thereinto, an outlet port at the opposite end of said reactor for removing reaction products therefrom and a reaction section in said reactor between said inlet port and said outlet port, the improvement comprising the side walls of said reaction section comprising a plurality of crimped annular plates separated by uncrimped annular plates, said crimped and uncrimped annular plates being disposed generally perpendicular to the longitudinal axis of said reaction section, the crimps of said crimped annular plates being generally radially directed with respect to the longitudinal axis of said reaction



section, whereby generally radially extending orifices through said reaction section side walls are formed between adjacent crimped annular plates and uncrimped annular plates; said reactor further comprising means for introducing at least one reactant radially inwardly through said orifices into the interior of said reaction section and means surrounding said reaction section walls for facilitating uniform introduction of reactants through said orifices; the openings of said orifices through the radially inner and outer surfaces of said reaction section side walls being distributed in a substantially continuous manner around the circumference of the side walls whereby the introduction of reactant gas through said side walls into the reaction section is effected substantially uniformly around the circumference of the reaction section.

4,012,202
PYROSCRUBBER

Henry James Byrne, Two Mountains; Raman Radha Sood, and David Michael Stokes, both of Arvida, all of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 2, 1975, Ser. No. 564,531

Claims priority, application United Kingdom, Apr. 3, 1974, 14886/74

Int. Cl.² C10B *1/10*; **F23G** *7/06*

U.S. Cl. 23—277 C **4 Claims**

1. A pyroscrubber device for removal and combustion of coarse, dense coke particles entrained in a stream of waste gas from a coke calcining furnace, comprising:

a. structure, including wall members, defining
   i. an elongated, U-shaped refractory-lined combustion chamber comprising a substantially rectangular upper passage and a substantially rectangular lower passage disposed under said upper passage,
   ii. a relatively large waste gas inlet disposed at one end of said upper passage for directing a stream of waste gas from the coke calcining furnace substantially along the center of the upper passage,

iii. a plurality of relatively small air inlet orifices arranged symmetrically about said waste gas inlet for directing jets of air obliquely toward the center of said upper passage to effect thorough mixing of air with the waste gas in a zone of the upper passage near the waste gas inlet and to propel the waste gas along the upper passage,

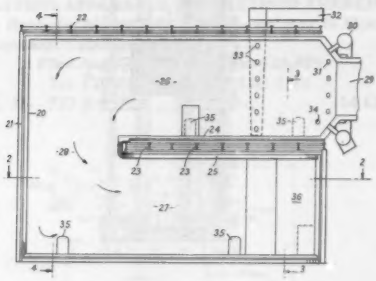
iv. a gas outlet in a vertical side wall and close to the end of the lower passage proximate to said one end of said upper passage,

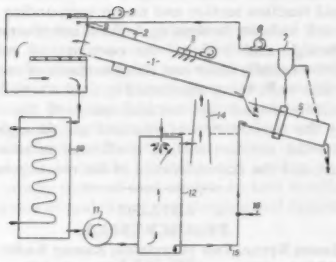
v. a stack for discharge of waste gas to atmosphere,

vi. structure defining a passage for conducting waste gas from said gas outlet to said stack, and

vii. gas flow control means in said passage for controlling flue draught in said stack;

b. means for supplying air under pressure to said air inlet orifices; and





c. means for receiving waste gas from the coke calcining furnace and introducing the waste gas into said waste gas inlet;

d. said upper passage communicating with said lower passage at the end of said upper passage opposite to said waste gas inlet for causing gas passing from the upper passage to the lower passage to undergo reversal in flow direction and consequent slip of entrained solid, dense coke particles in relation to the admixed air to accelerate combustion of the particles; and

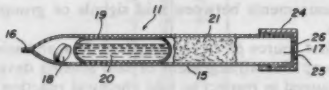
e. said upper and lower passages presenting a substantially unrestricted path for flow of waste gas therethrough and said gas undergoing a further substantial change in flow direction in passing from said lower passage to said outlet to promote further slip of said particles.

4,012,203

GAS GENERATING APPARATUS FOR USE WITH CULTURE TRANSPORT AND STORAGE

Charles Eugene Rosiere, East Aurora, N.Y., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Filed Jan. 30, 1976, Ser. No. 654,027
Int. Cl.² B01J *7/02*
U.S. Cl. 23—282 **7 Claims**



1. A gas generating apparatus comprising:

an elongated flexible tube closed at one end and having an opening at the other end,

a carbon dioxide generating material in the tube,

an ampoule in the tube containing a liquid which is reactive with the carbon dioxide generating material to produce carbon dioxide, said ampoule being rupturable by squeezing the outside of the tube to free the liquid to contact the carbon dioxide generating material, and

a plug located in the tube between the ampoule and the opening in the tube which prevents liquid from flowing from the tube after the ampoule is opened but which permits flow of the carbon dioxide gas generated in the tube out of the opening.

4,012,204

ALUMINUM ALLOY REINFORCED WITH ALUMINA FIBERS AND LITHIUM WETTING AGENT

Paul Gordon Riewald; William Henry Krueger, and Ashok Kumar Dhingra, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 522,881, Nov. 11, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,356
Int. Cl.² C22C *1/09*
U.S. Cl. 29—191.2 **22 Claims**

1. A composite reinforced with 10–80 volume percent of polycrystalline alumina fibers and having a matrix of an aluminum alloy containing about 0.5–5.5% by weight of lithium in which the fibers have a reaction sheath of a thickness less than 15% of the total fiber diameter and the composite has a porosity of less than about 10%.

4,012,205

THICKENED HYDROCARBON FUELS

Leonard Cohen, Bel Air, Md., and William J. Connick, Jr., New Orleans, La., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 5, 1966, Ser. No. 519,171
Int. Cl.² C10L *7/00, 7/02*
U.S. Cl. 44—7 C **8 Claims**

1. A composition of matter consisting essentially of a combustible liquid hydrocarbon and a reaction product of tolylene diisocyante with a member of the group of consisting of:

a. a mixture comprising a member of the group consisting of oleylamine and linoleylamine with the bis(3-aminopropylamino) derivatives of dimerized linoleyl acid,

b. a mixture comprising a member of the group consisting of oleylamine and linoleylamine with a member of the group consisting of 1,4-di(aminomethyl) cyclohexane and menthane diamine,

c. a mixture of β-amino derivatives of 15–20 carbon n-alkanes.

4,012,206

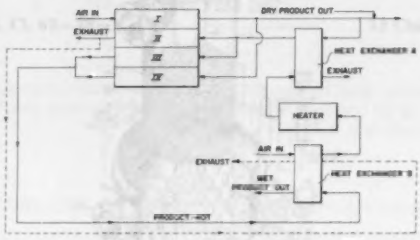
AIR CLEANING ADSORPTION PROCESS

Robert A. Macriss, Deerfield; William F. Rush, Arlington Heights, and Sanford A. Weil, Chicago, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 314,400, Dec. 2, 1972, Pat. No. 3,844,737, which is a continuation-in-part of Ser. No. 24,373, March 31, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,784

Int. Cl.² B01D *53/06*

U.S. Cl. 55—34 **7 Claims**



1. A process for air cleaning by the removal of water and one or more undesired gaseous components selected from the group consisting of NO_x, SO_x and CO_2 by a continuously adsorbing and regenerating of the adsorbent body, atmospheric pressure and low pressure drop process comprising the steps:

continuously passing air to be treated through an adsorbent body consisting essentially of thin sheets or layers of fibrous material containing about 10% to about 90% by weight of a finely divided crystalline molecular sieve material for a time sufficient to permit the molecular sieve material to adsorb the NO_x, SO_x and CO_2 from said air to an acceptable pollutant level and removing dry and clean product air in a first phase; and

regenerating said adsorbent body by continuously passing countercurrent to the treatment air through said adsorbent body in a second phase a portion of the dry and clean product air heated to a temperature of more than about 300° F. removing the pollutants from said adsorptive body and then passing a portion of the dry and clean product air countercurrently through said adsorbent body in a third phase until the desired amount of moisture is removed and the adorbent body cooled for recycle of the adsorbent body to the first phase.

4,012,207

EMULSION TREATER

Jeffrey A. Jones, Taft, Calif., assignor to Chanslor-Western Oil and Development Company, Sante Fe Springs, Calif.

Filed Apr. 5, 1976, Ser. No. 673,588

Int. Cl.² B01D *19/00*

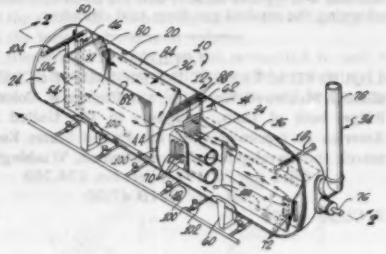
U.S. Cl. 55—174 **22 Claims**

1. An emulsion treater for oil/water emulsion, such as oil well production, comprising:

an elongate emulsion treater tank to be disposed in a normal position with its longitudinal axis generally horizontal,

baffle means within said tank defining an emulsion heating chamber at one end of the tank having an emulsion inlet to said chamber, an emulsion settling chamber at the other end of the tank, and an emulsion flow path for conducting emulsion from said inlet to an oil recovery zone in said settling chamber,

said flow path including a horizontally folded, generally sinuous portion in said heating chamber comprising successive normally generally horizontal segments of said flow path forming emulsion preheating, direct heating, and post heating zones respectively, disposed in parallel, horizontally side by side heat transfer relation with each direct heating zone located between a preheating zone and a post heating zone and communicating at one end to the adjacent end of the preheating zone and at the other end to the adjacent end of the post heating zone, and said flow path further including a normally, generally horizontal portion in said settling chamber forming an emulsion settling zone,



emulsion heating means within each direct heating zone,

vapor removal means for exhausting vapor from the top of said zones,

water removal means for draining water from the bottom of said zones, and

oil removal means for extracting oil from an intermediate level of said oil recovery zone.

4,012,208

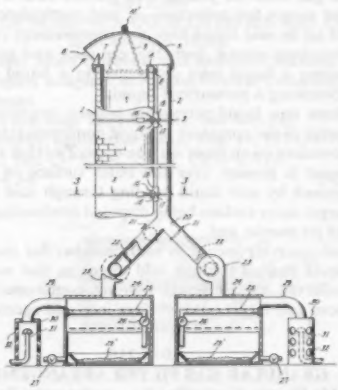
ANTI-POLLUTION UNIT FOR ATTACHMENT ON SMOKE STACKS, AND THE METHOD OF REDUCING SMOKE STACK POLLUTION

Lawrence E. Arnim, and Lawrence E. Arnim, Jr., both of 516 W. Main St., Houston, Tex. 77006

Filed Aug. 20, 1975, Ser. No. 606,178

Int. Cl.² B01D *47/06*

U.S. Cl. 55—223 **6 Claims**



1. In an anti-pollution device for attachment to smoke stacks, a crown formed to be detachably mounted on the top of a smoke stack and to extend over and above the top of the stack, a supporting harness on said crown having an adjustable horizontal cable around said crown at its juncture with the stack, and adjustable cross cables extending from said horizontal cable to a ring mounted in the outside top wall of the crown at its vertical axis, said crown having an opening into the ambient atmosphere, said opening forming a lateral air inlet in said crown and a conduit leading from and in flow connection with said crown and mounted in parallel relation

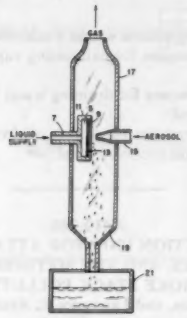
with said stack, a baffle in said crown directing a flow of air across the top of the stack and into said conduit, said conduit terminating in a dual connection, each leg of said dual connection having a fan mounted therein adapted to selectively form an air stream through said crown and conduit when said stack is in operation, entraining the emission from the stack, and each leg terminating in an independent housing, means for maintaining a water spray in each of said housings through which said stack emission is selectively passed, and means for discharging the washed gas from said chamber.

4,012,209

LIQUID FILM TARGET IMPINGEMENT SCRUBBER

William J. McDowell, Knoxville, and Charles F. Coleman, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 5, 1976, Ser. No. 674,200
Int. Cl.² B01D *47/00*
U.S. Cl. 55—240 **4 Claims**



1. In an impingement separator for removing particulates from an aerosol including an impingement chamber having a gas inlet and a gas outlet spaced therefrom, a nozzle provided in said gas inlet for jetting said aerosol onto a liquid film covered target for collection of said particulates from the aerosol jet by said liquid film, the improvement comprising:

a container spaced from the gas inlet and gas inlet and having a liquid inlet connected to a liquid supply and containing a pressurized liquid;

at least one liquid-permeable impact target covering an outlet of the container in liquid communication with said container on an inner surface thereof so that a film of said liquid is present over the outer surface of said target formed by said liquid exuding through said target, said target outer surface being disposed confronting said aerosol jet nozzle; and

liquid-receiving means in said chamber for receiving said liquid exuded through said target so that said particles collected by said liquid film are continuously removed from said target outer surface into said receiving means.

4,012,210

GRANULAR GAS FILTER ARRANGEMENT

John M. Morris, Louisville, Ky., assignor to Rexnord Inc., Racine, Wis.

Filed Feb. 23, 1976, Ser. No. 660,363
Int. Cl.² B01D *45/00*
U.S. Cl. 55—479 **9 Claims**

1. A moving bed filter arrangement including:

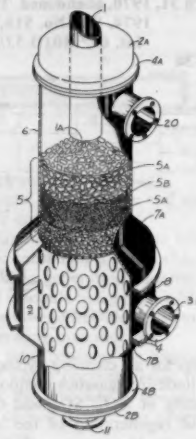
a. An enclosed generally vertical vessel defining a gas cleaning chamber, said vessel having granular filter media inlet means in the upper portion thereof and granular filter media outlet means in the lower portion thereof;

b. at least one first gas conduit means communicating with the upper portion of said vessel;

c. gas plenum means surrounding the periphery of the lower portion of said vessel;

d. apertures in the sidewall of said vessel means communicating with the lower portion of said vessel and said plenum means;

e. gas conduit means communicating with said plenum means;



f. filter media inlet tube means extending into said vessel from said media inlet opening into said chamber for admission of filter media to said chamber; and,

g. means to remove granular filter media from said vessel by means of said filter media outlet means; and

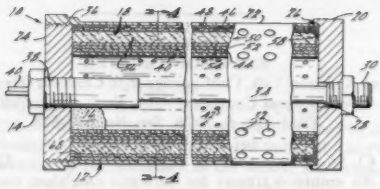
h. a bed of granular filter media disposed within said vessel between said granular material inlet and outlet means.

4,012,211

FILTER FOR OCCUPANT RESTRAINT SYSTEM FLUID SUPPLY

George W. Goetz, Detroit, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed June 30, 1975, Ser. No. 591,911
Int. Cl.² B01D *29/26*
U.S. Cl. 55—485 **11 Claims**



1. A filter for a radially outward flow gas generator comprising:

a radially resilient tubular assembly having a longitudinal slit formed therein extending the length thereof, and including:

a. fluid permeable outer support means;

b. inner support means formed of fluid permeable material and disposed radially inwardly of said outer support means and including means for longitudinally closing the radially inward end of said slit to prevent the passage of gas through the slit; and

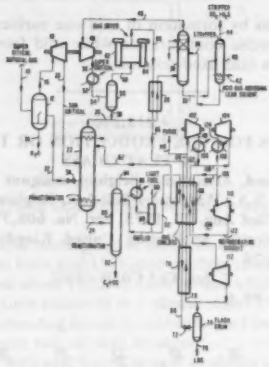
c. a plurality of layers of generally tubular concentric deformable fibrous filter material, disposed between said inner and outer support means each having longitudinal

slits which are aligned with one another such that they all lie in substantially the same plane, said sheets being adapted to effect filtration of the combustion products of the gas generator.

4,012,212
PROCESS AND APPARATUS FOR LIQUEFYING NATURAL GAS

Ludwig Kniel, Scarsdale, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed July 7, 1975, Ser. No. 593,222
Int. Cl.² F25J *3/02*
U.S. Cl. 62—28 **13 Claims**



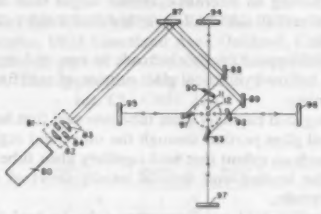
1. A method of liquefying natural gas having a pressure above the critical pressure thereof, which comprises:
   a. expanding said natural gas to a pressure below the critical pressure thereof;
   b. introducing the expanded gaseous stream of step (a) into a fractionating zone to remove as a liquid a C_5+ hydrocarbon stream;
   c. compressing the resulting gas stream recovered from step (b) to a pressure above the critical pressure thereof;
   d. cooling the cooled gas stream of step (c);
   e. expanding said cooled gas stream from step (d) to effect liquefaction of a major portion of said cooled gas stream of step (d), and
   f. recovering said liquified major portion.

4,012,213
APPARATUS FOR FORMING REFRACTORY FIBERS

John S. Haggerty, Lincoln; Wilson P. Menashi, Lexington, and Joseph F. Wenckus, Needham, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Division of Ser. No. 369,884, June 14, 1973, Pat. No. 3,944,640, which is a continuation of Ser. No. 68,810, Sept. 2, 1970, abandoned. This application Mar. 19, 1975, Ser. No. 559,797
Int. Cl.² C03B *37/02*
U.S. Cl. 65—13 **8 Claims**

1. An apparatus for forming refractory fibers, comprising in combination
   a. a feed rod of refractory material in which a melt volume is maintained principally through surface tension forces;
   b. two oppositely disposed rod holding means arranged to hold first and second solid sections of said refractory material, said first of said solid sections being said feed rod and said second of said solid sections terminating in a fiber drawn from said melt volume;
   c. laser means to provide radiant energy to form a heating zone of sufficiently high energy density and total power to form said melt volume in said feed rod while retaining in said melt volume a high degree of stability to perturbations from its equilibrium shape;
   d. optical means adapted to divide said radiant energy from said laser means into a plurality of beams symmetrically positioned about the axis of said feed rod;
   e. means to focus said plurality of beams onto said melt volume and to direct said radiant energy in a manner to limit the extent of said heating zone so that it is no greater than the length of said melt volume;
   f. first translational moving means connected to said rod holding means holding said first solid section and arranged to introduce said feed rod into said heating zone

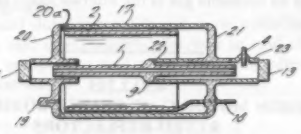


   thereby to continuously form said melt volume of said refractory material;
   g. second translational moving means connected to said rod holding means holding said second section and adapted to draw said fiber from said continuously formed melt volume; and
   h. driving means for driving said first and second translational moving means at velocities such that the product of fiber cross section, fractional density, and drawing velocity is essentially equal to the product of feed rod cross section, fractional density and moving velocity, whereby said translational moving means in conjunction with the configuration of said heating zone maintains said melt volume in its stable condition.

4,012,214
METHOD OF MAKING A COLD CATHODE GAS LASER DISCHARGE TUBE

Takao Furuse; Akira Kuroiwa, and Sadatane Sakuma, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 605,144
Claims priority, application Japan, Aug. 19, 1974, 49-94717
Int. Cl.² C03C *29/00;* **C03B** *23/20*
U.S. Cl. 65—34 **2 Claims**



1. A method of making a cold cathode gas laser discharge tube of reduced size, comprising the steps of:
   preparing a capillary glass tube having a substantially straight longitudinal axis; an anode electrode; a first envelope member consisting of a first hollow cylindrical glass portion having an internal diameter larger than the external diameter of said capillary glass tube, a first annular disc flange portion of glass extending radially from said hollow cylindrical glass portion intermediate the ends thereof and at least one electrode supporting terminal member extending through said first annular disc flange portion, said first hollow cylindrical glass portion and said

first annular disc flange portion being formed jointly by press molding; a second envelope member consisting of a second hollow cylindrical glass portion having an internal diameter larger than the external diameter of said capillary glass tube and a second annular disc flange portion of glass extending radially from said second hollow cylindrical glass portion intermediate the ends thereof, said second hollow cylindrical glass portion and said second annular disc flange portion being formed jointly by press molding; a hollow cylindrical cold cathode electrode having an internal diameter larger than the external diameter of said first and second hollow cylindrical glass portions, respectively, of said first and second envelope members; and a hollow cylindrical glass envelope member having an internal diameter larger than the external diameter of said hollow cylindrical cold cathode electrode;

heat-sealing said anode electrode to one end region of said first hollow cylindrical glass portion of said first envelope member;

inserting said capillary glass tube into said first hollow cylindrical glass portion through the other end region thereof to such an extent that said capillary glass tube terminates at the leading end thereof axially short of said anode electrode;

heat-sealing said capillary glass tube to said first hollow cylindrical glass portion at the axial end thereof remote from said anode electrode while holding said capillary glass tube in substantially coaxial relation with said first hollow cylindrical glass portion;

securing said hollow cylindrical cold cathode electrode at one axial end thereof to the adjacent end of said electrode supporting terminal member so that the axis of said cathode electrode is substantially coaxially aligned with the axis of said capillary glass tube;

heat-sealing said annular disc flange portion of said second envelope member to said hollow cylindrical glass envelope member at one end thereof while holding the adjacent end region of said second hollow cylindrical glass portion inserted in said hollow cylindrical cold cathode electrode;

heat-sealing said annular disc flange portion of said first envelope member to said hollow cylindrical glass envelope member at the other end thereof with the end region of said capillary glass tube remote from said anode electrode inserted in said adjacent end region of said second hollow cylindrical glass portion in substantially coaxial relation therewith;

sealingly securing optical window members to the respective axially outer ends of said first and second hollow cylindrical glass portions thereby to complete a gas-tight structure enclosing said capillary glass tube and said hollow cylindrical cold cathode electrode; and

sealing an ionizable gas in the interior space of said gas-tight structure.

4,012,215
PRECISION MOLDING OF SHAPED BODIES SUCH AS RETRO-REFLECTORS

Kurt Schwab, Innsbruck, and Josef Steinlechner, Milserheide, both of Austria, assignors to D. Swarovski & Co., Wattens-Tirol, Austria

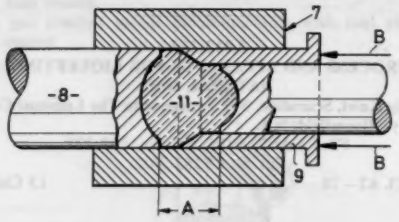
Filed Aug. 11, 1975, Ser. No. 603,491

Claims priority, application Germany, Aug. 13, 1974, 2438836

Int. Cl.² B29C *11/00;* **B29D** *11/00;* **C03B** *11/08*

U.S. Cl. 65—66 **10 Claims**

1. A process for forming a formable mass into a body having surfaces of precise, predetermined configuration and at least one other surface which need not be of precise configuration, comprising the steps of introducing such formable mass from which such body is to be formed into a mold having a cavity introducing forming dies into said mold; positioning said dies in a predetermined fixed relation while forming said mass into a preliminary shape having said surfaces of precise, predetermined configuration, and effecting a final molding of the



formable mass by formation of said one surface which need not be of precise configuration while said forming dies are maintained in said fixed relation.

4,012,216
APPARATUS FOR THE PRODUCTION OR TREATMENT OF FLAT GLASS

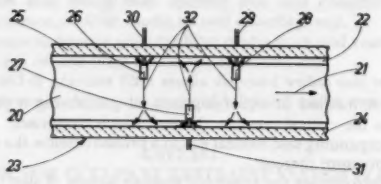
Jean Marchand, Alsemberg, Belgium, assignor to Glaverbel-Mecaniver S.A., Watermael-Boitsfort, Belgium

Filed Aug. 28, 1975, Ser. No. 608,773

Claims priority, application United Kingdom, Aug. 28, 1974, 37685/74

Int. Cl.² C03B *18/02*

U.S. Cl. 65—99 A **12 Claims**



1. In a process for the production or treatment of flat glass in an elongate tank containing a bath of molten material including delivering glass to the bath, advancing the glass along a path in contact with the bath towards an outlet for the glass from the tank, and creating displacements of said molten material in one part of the width of said bath, the improvement comprising inducing in the molten material opposed currents each directed toward one of the sides of the tank across an entire zone of the tank where the viscosity of the glass lies in the range between $10^{5.2}$ and $10^{6.9}$ poise and causing said currents to flow across substantially the full width of the glass for preventing formation in the finished glass of faults or surface defects caused by advancing of the glass along the tank in contact with the molten material in the bath.

4,012,217
BENDING SILICON RODS INTO U-SHAPES

Konrad Reuschel, Vaterstetten; Ulrich Rucha, and Gerhard Schrotter, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 7, 1975, Ser. No. 629,916

Claims priority, application Germany, Nov. 18, 1974, 2454592

Int. Cl.² C03B *23/06*

U.S. Cl. 65—102 **16 Claims**

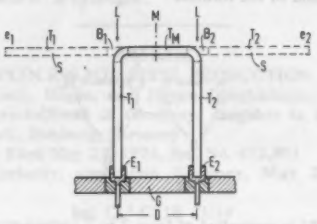
1. In a method for depositing silicon on surfaces of a U-shaped carrier member comprised of silicon, involving the steps of

A. mounting a U-shaped carrier member rod by its free ends in an upright position in a treating zone, each such free

end contacting a different electrode member for passage of an electric current therethrough, and

B. heating the so mounted rod by an electric current passed therethrough while simultaneously flowing a reaction gas through said treating zone to deposit uniformly silicon on surface portions of said so mounted rod,

the improvement which comprises bending at predetermined zones heated to plasticity into a U-shaped configuration an initially substantially straight, elongated silicon starting rod having a transverse thickness ranging from about 3 to 50 mm and a homogeneous cross section without substantially lengthening or shortening said rod, said bending is accomplished by the steps of



A. heating said starting rod at locations thereof which are to be bent to form said U-shaped configuration to a temperature from about 1100° to 1400° C and which is sufficient to place such locations in a plastic state,

B. applying bending forces to said so heated rod adjacent to, and on each side of, said locations,

C. bending with said forces at said locations said so heated rod into a predetermined, desired U-shaped configuration, and

D. cooling the resulting rod at said locations to a solid state.

4,012,218

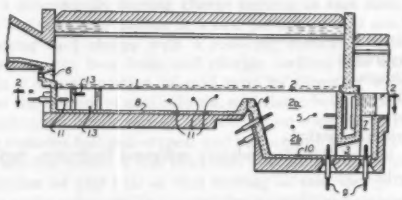
METHOD AND APPARATUS FOR MELTING GLASS

Helmut Sorg, Im Himbeergrund 33, 8752 Glattbach, and Helmut Pieper, Buchenstrasse 19, 877 Lohr, both of Germany

Filed Nov. 13, 1975, Ser. No. 631,563

Int. Cl.² C03B *5/02*

U.S. Cl. 65—135 **17 Claims**



1. Glass melting furnace comprising a melting section, a refining section adjacent to the melting section, an enclosed heating section above and common to the melting and refining sections, the depth of the refining section being at least twice the depth of the melting section, means to supply unmelted glass batch to the surface of the molten glass bath in the melting and refining sections, means to heat the heating section such that the batch is heated and melted at the interface between the molten glass bath and the batch, and outlet means at the bottom of the refining section for discharging refined molten glass.

11. Method for melting and refining glass in a furnace containing a molten glass mass in a melting zone and an adjacent refining zone having a depth at least twice the depth of the melting zone, said furnace having a common heating zone above the melting and refining zones, which comprises:

i. applying a layer of unmelted batch mixture to the surface of said molten glass mass in the melting and refining zones;

ii. subjecting the batch mixture to heat energy from the heating zone over the entire surface of the unmelted batch to melt same at the interface between the molten glass mass and the batch;

iii. withdrawing refined molten glass from the bottom of the refining zone thereby causing molten glass to flow from the melting zone to the refining zone and to descend in the refining zone where the molten glass is homogenized without supplying energy thereto.

4,012,219

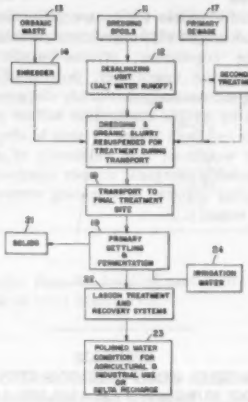
METHOD FOR RECLAIMING VARIEGATED WASTES

Walter Josephs, 1924 Courtland Ave., Oakland, Calif. 94601

Continuation-in-part of Ser. No. 569,553, April 18, 1975, abandoned. This application May 6, 1976, Ser. No. 683,786

Int. Cl.² C05F *11/08*

U.S. Cl. 71—9 **4 Claims**



1. A method for reclaiming waste products and dredging spoils, comprising the steps of:

desalinating clay-bearing dredging spoils by placing the spoils in corrals, segregating the sea water from the sediment, and draining away the sea water,

mixing said desalinated dredging spoils with sewage to form a slurry,

piping said slurry to a disposal site and mixing said slurry during piping to effect exposure and adsorption of contaminants of said primary sewage to the clay particles of said dredging spoils,

separating said slurry into solids and waste water, said solids including said contaminants adsorbed to said clay particles, and composting said solids remaining after separation of said slurry.

4,012,220

COMPOSITION FOR SUPPLYING THE SPECIFIC DEFICIENCY IN MICROELEMENTS OF PLANTS CULTIVATED ON PEATY SOILS

Sandor Szalay, and Zoltan Samsoni, both of Debrecen, Hungary, assignors to Magyar Tudomanyos Akademia Atommag Kutato Intezete, Debrecen, Hungary

Filed Aug. 8, 1975, Ser. No. 603,200

Claims priority, application Hungary, Aug. 15, 1974, MA 2597

Int. Cl.² C05G *3/00*, *3/06*

U.S. Cl. 71—11 **3 Claims**

1. An aqueous micronutrient foliage spray for the foliage of plants cultivated on a peat soil which consists essentially of an

aqueous solution containing 0.1 to 5% by weight of Mn^{2+} 0.03 to 1.2% Cu^{2+} and 0. to 1.6% Fe^{2+} in addition to sufficient tartaric acid reducing agent to prevent oxidation of the manganese and iron on the foliage of the plants to insoluble oxide-hydroxide, and an effective amount of a chelating agent to complex the manganese, copper and iron to maintain the same in solution, the solution, having a pH of 4 to 6 and the ratio of copper to manganese being 1:3 to 1:6.

4,012,221

SLOW RELEASE COPPER TOXICANT COMPOSITIONS

Katherine E. Walker, Akron, and Nathan F. Cardarelli, Barberton, both of Ohio, assignors to International Copper Research Association Inc., New York, N.Y.

Filed May 13, 1975, Ser. No. 577,051
Int. Cl.² A01N *11/04*
U.S. Cl. 71—66 **8 Claims**

1. A sustained release toxicant composition comprising a moderately vulcanized elastomeric matrix selected from ethylene-propylene copolymer, styrene-butadiene copolymer, isobutylene-isoprene copolymer, polybutadiene or natural rubber having substantially uniformly dispersed therein up to about 5 parts by weight ammonium sulfate per 100 parts of said elastomer and from about 75 parts to about 400 parts per 100 parts by weight of said elastomer of a water-soluble, elastomer-insoluble inorganic copper compound, said copper compound being capable of releasing copper ions when in contact with water.

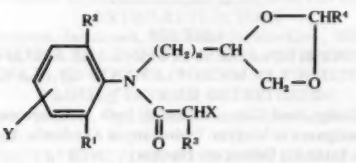
4,012,222

HERBICIDAL COMPOSITIONS CONTAINING DIOXOLANE SUBSTITUTED ANILIDS AND METHOD THEREFOR

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 523,388, Nov. 13, 1974, Pat. No. 3,946,045. This application Jan. 5, 1976, Ser. No. 646,719
The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.
Int. Cl.² A01N *9/00*
U.S. Cl. 71—88 **9 Claims**

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein Y is selected from the group consisting of hydrogen, lower alkyl and halogen, R^1 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; R^2 is lower alkyl; R^3 and R^4 are independently selected from the group consisting of hydrogen and lower alkyl; X is halogen; and *n* is the integer 1 or 2.

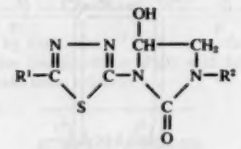
4,012,223

THIADIAZOLYLIMIDAZOLIDINONES HERBICIDES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 442,702, Feb. 15, 1974, Pat. No. 3,920,674, which is a continuation-in-part of Ser. No. 432,269, Jan., 1974, abandoned. This application Aug. 28, 1975, Ser. No. 608,473
Int. Cl.² A01N *9/22*
U.S. Cl. 71—90 **2 Claims**

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein R^1 is cycloalkyl of from 3 to 7 carbon atoms optionally substituted with lower alkyl, lower alkoxy, chlorine, bromine, or hydroxy, and R^2 is lower alkyl.

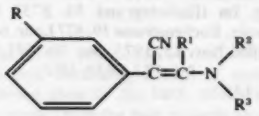
4,012,224

HERBICIDAL USE OF β-AMINOATROPONITRILES

James Richard Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 2, 1975, Ser. No. 636,884
Int. Cl.² A01N *9/20*
U.S. Cl. 71—105 **7 Claims**

1. A method of reducing the vigor of weeds which comprises contacting the weeds with an herbicidally-effective amount of a compound of the formula



wherein R represents
hydrogen,
chloro,
fluoro,
bromo or
trifluoromethyl;
R^1, R^2 and R^3 independently represent hydrogen, methyl or ethyl.

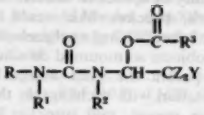
4,012,225

HERBICIDAL 1-ALKANOYLOXY-HALOETHYL UREA

Malcolm Scott Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 423,598, Dec. 10, 1973, Pat. No. 3,916,010, which is a continuation-in-part of Ser. No. 385,521, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,422, March 16, 1971, abandoned, and Ser. No. 124,423, March 16, 1971, abandoned. This application May 30, 1975, Ser. No. 582,482
Int. Cl.² A01N *9/24*
U.S. Cl. 71—106 **12 Claims**

1. A method for controlling undesirable vegetation which comprises applying thereto an herbicidally effective amount of a compound of the formula



wherein R is phenyl substituted with 1 to 2 fluorine or chlorine; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms, R^2 is alkyl of 1 to 4 carbon atoms; Z is chlorine or bromine; Y is hydrogen or Z, and R^3 is hydrogen.

4,012,226

PROCESS FOR STEEL PRODUCTION

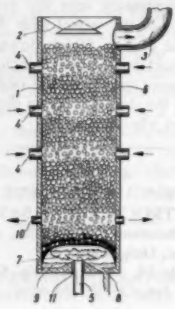
Günther Geck, Hagen, and Jürgen Langhammer, Bremen-Platjgenwerbe, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed May 23, 1974, Ser. No. 472,891

Claims priority, application Germany, May 25, 1973, 2326684

Int. Cl.² C21B *13/14*

U.S. Cl. 75—38 **15 Claims**



1. A process for the production of steel from a reducible iron-containing charge, comprising the steps of introducing said charge into a generally vertically extending zone so as to form a downwardly moving charge column in said zone; directly reducing said charge in a first portion of said zone by contacting said charge with a reducing substance thereby forming sponge iron from said charge; melting said sponge iron in a second portion of said zone by directing a flame against the bottom of said column, said flame being produced by combustion in said second portion of said zone of a mixture which includes fuel and oxygen, and said oxygen being present in an amount which is less than that necessary for complete combustion of said fuel so that melting of said sponge iron occurs under substantially non-oxidizing conditions; passing at least part of the combustion gases generated by said combustion through at least part of said column and in countercurrent motion to the latter; and withdrawing the molten material produced by melting of said sponge iron from said zone.

4,012,227

HIGHLY CASTABLE, WELDABLE, CORROSION RESISTANT STAINLESS STEEL

Robin Mackay Forbes Jones, Titusville, and Walter Adrian Petersen, Ridgewood, both of N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed June 19, 1975, Ser. No. 588,197

Int. Cl.² C22C *38/44*, *38/54*

U.S. Cl. 75—122 **2 Claims**

1. A highly-castable, ductile, corrosion resistant and weldable stainless steel consisting essentially of, by weight, from about 22% to about 26% chromium, from about 20% to about 30% nickel, from about 2.5% to about 5% molybdenum, from about 1.3% to about 2.7% silicon, from about 0.15% to about 0.3% boron, up to about 2% manganese, up to about 0.07% carbon, and the balance iron with incidental impurities, said stainless steel characterized by sea-air, splash and spray corrosion resistance superior to that exhibited by commercial stainless steels CN-7M and CN-8M and exhibiting freedom from heat-affected zone and weld deposit cracking and being further characterized by a minimum elongation in the room temperature tensile test of at least 10% in the as cast condition.

4,012,228

LOW INTRINSIC VALUE ALLOYS

Ronald P. Dudek, River Grove; Peter Kosmos, Alsip, and John A. Tesk, Woodridge, all of Ill., assignors to Howmedica, Inc., New York, N.Y.

Filed May 14, 1976, Ser. No. 686,346

Int. Cl.² C22C *30/00*

U.S. Cl. 75—134 C **7 Claims**

1. An alloy consisting essentially of the following constituents in the indicated percentages by weight:

Constituents	Proportional Range
Gold	0–45%
Platinum	0–30%
Palladium	0–20%
Copper	30–55%
Gallium	5–10%
Zinc	0–1%
Iridium	0–0.01%

with the proviso that the total of said gold, platinum and palladium is at least about 35%.

4,012,229

DUCTILE COBALT-BASE ALLOYS

Robert B. Herchenroeder, and Coleman M. Augustine, Jr., both of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Oct. 10, 1972, Ser. No. 295,992

Int. Cl.² C22C *19/07*

U.S. Cl. 75—171 **3 Claims**

1. A cobalt-base alloy characterized by improved ductility at high temperatures of about 2000° F. and consisting essentially of about 15 to 30% chromium, about 10 to 30% nickel, an effective amount from about 1 to 8% molybdenum to impart ductility, up to about 10% tungsten, about 8 to 20% tantalum and the balance cobalt with incidental modifiers and impurities in ordinary amounts.

4,012,230

TUNGSTEN-NICKEL-COBALT ALLOY AND METHOD OF PRODUCING SAME

James M. Dickinson, and Robert E. Riley, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 7, 1975, Ser. No. 593,356

Int. Cl.² C22C *1/04*; B22F *3/16*

U.S. Cl. 75—212 **1 Claim**

1. A method of producing a dense tungsten-nickel-cobalt alloy which comprises (a) coating tungsten particles with a nickel-cobalt alloy, (b) pressing the coated particles into a coherent compact shape, (c) heating said compact in a hydrogen atmosphere to a temperature in the range of 1200° C to 1400° C and maintaining this temperature for a period of about 2 hours, (d) increasing the temperature to a range of 1300° C to 1530° C and holding at this elevated temperature

for a period of about one hour, (e) cooling to a temperature of about 1200° C, replacing the hydrogen atmosphere with an inert argon atmosphere while maintaining 1200° C temperature for a period of about ½ hour, and (f) cooling the tungsten-nickel-cobalt alloy compact to room temperature while maintaining this argon atmosphere.

4,012,231

PROCESS FOR THE MANUFACTURE OF FILLERS FROM SOLID WASTE

Gottfried Dreer, 43 Jrawehlstrasse, Essen, Germany (4300)

Filed Feb. 18, 1975, Ser. No. 550,585

Claims priority, application Germany, Feb. 15, 1974, 2407383

Int. Cl.² C04B *31/40*

U.S. Cl. 106—288 B **4 Claims**

1. A process for the production of fillers from solid waste which for conversion into compost, is first ground, magnetically freed from iron particles, supplied with sewage sludge or water, fractionated into portions of different size and treated in a fermentation process for about 24 hours at 65° C while fresh air is continuously fed, the improvement comprising forming a mixture of the compost and a solvent in a first heatable tank at a ratio of 1:2–4 parts by weight of compost-:solvent and stirring said mixture from the start to the end of the introduction of the components therein; maintaining the contents in the first tank for a period of time ranging from about 10 to 16 hours; heating to dryness the contents of the first heatable tank; transferring the contents of the first heatable tank to a second tank; adding to said second tank about 2–3 percent of chlorinated paraffin and about 1–3 percent antimony trioxide; mixing the contents in said second tank; and heating the contents of the second tank until dryness is reached.

4,012,232

STABILIZED PHOTOCHROMIC MATERIALS

Donald R. Uhlmann, Newton; Elias Snitzer, Wellesley; Richard J. Hovey, Sturbridge, Nori Y. C. Chu, Southbridge, all of Mass., and Joseph T. Fournier, Jr., Storrs, Conn., assignors to Nori Y. C. Chu, Southbridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,452

Int. Cl.² G02B *5/23*

U.S. Cl. 106—308 B **18 Claims**

1. A stabilized photochromic particle for incorporation into a plastic host to impart photochromic properties thereto, said particle comprising an organic photochromic pigment crystal having a diameter in the range of 30 A to 1 micron, said photochromic crystal having a protective coating on substantially the entire surface thereof effective to render the photochromic, crystal impervious to the effects of oxygen, moisture, monomers, catalysts, and other chemicals used in the formation of the plastic host which are deleterious to said crystal.

4,012,233

CONVEYOR FOR CONTAINERS FOR CARRYING OBJECTS OF GLASS OR SIMILAR MATERIALS, WHICH OBJECTS ARE TO BE HARDENED CHEMICALLY BY SURFACE TREATMENT

Harald Damer, Weimar; Kurt Kessler, Jena; Ulrich Kühne, Torgau; Kurt Schneider; Karl Unbehaun, both of Jena; Manfred Wilke, Jena-Lobeda, and Johannes Franke, Jena, all of Germany, assignors to VVB Haushalts-und Verpackungsglas, Jena, Germany

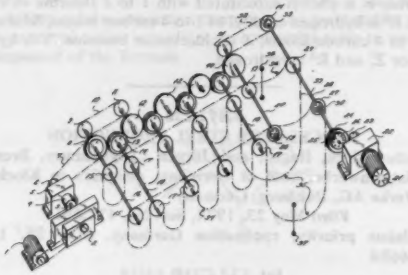
Filed July 18, 1975, Ser. No. 597,110

Claims priority, application Germany, July 31, 1974, 180213

Int. Cl.² B08B *3/08*

U.S. Cl. 134—75 **3 Claims**

1. In combination with at least one vessel for containing a liquid substance for surface treating objects of glass or similar materials, a conveyor for transporting the objects through treatment, loading and unloading zones comprising at least one vessel for containing the liquid substance, the conveyor comprising a plurality of sprocket wheels, means for driving said sprocket wheels, sprocket chain means trained over said sprocket wheels and freely hanging therebetween, means for carrying the glass objects so mounted on said sprocket chain means as not to permit the glass objects substantially to change their orientation with a change in the orientation of said sprocket chain means, said sprocket wheels and said



sprocket chain means being so arranged that the glass objects are first carried downwardly into the vessel and are then carried upwardly out of the vessel with the opening of any cavity in each of the objects facing downwardly during the upward movement, said driving means including clutch means for engaging and disengaging selected ones of said sprocket wheels for changing the depth of chain dip between selected ones of said sprocket wheels.

4,012,234

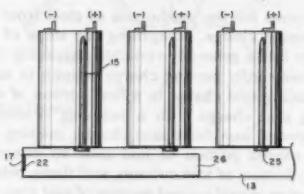
WATER ACTIVATION AND PRESSURE EQUALIZATION OF ELECTROCHEMICAL BATTERIES

Dennis W. Kraft, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 14, 1975, Ser. No. 595,586

Int. Cl.² H01M *6/00*

U.S. Cl. 429—48 **15 Claims**



1. A fully charged battery pack adapted to be stored for an extended period and then put into use in a body of water below some predetermined depth comprising:

at least one electrochemical battery having positive and negative plates and an electrolyte for generating electricity, said battery having its electrolyte removed after the battery is fully charged;

a reservoir having a water inlet admitting water into said reservoir, said reservoir containing a substance for restoring an electrolyte in said battery;

means positioned within said water inlet for closing said inlet to prevent entry of water below a predetermined depth pressure, thereby admitting water under pressure through said water inlet into said reservoir when said battery pack is dropped into said body of water;

a tube connecting said reservoir to said battery; and

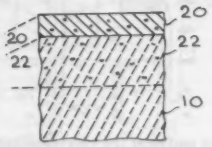
means associated with said tube responsive to pressure from said body of water for forcing said substance through said tube into said battery under depth pressure of said body of water.

4,012,235

SOLID PHASE EPITAXIAL GROWTH

James W. Mayer; Marc A. Nicolet, and Silvanus S. Lau, all of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 4, 1975, Ser. No. 565,129
Int. Cl.² H01L 21/20
U.S. Cl. 148—1.5 6 Claims



1. A method of growing epitaxially a doped silicon layer upon a silicon substrate comprising,

depositing over said silicon substrate a first material layer selected from one of palladium, vanadium, titanium, and nickel,

depositing over said first metal layer a doping layer of one of, antimony, phosphorus, aluminum, boron, gallium, indium, thallium, arsenic, and bismuth,

depositing over said doping layer a layer of silicon,

heating said substrate and layers to a first temperature below their eutectic point temperature until said silicon layer forms a silicide of said first metal layer, and

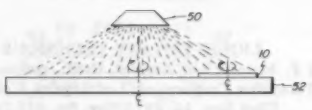
heating said substrate and layers at a second temperature which is higher than the first temperature but still below said eutectic temperature to cause migration of said dopant and said silicon through said silicide layer and nucleation and growth thereof upon the surface of said crystal.

4,012,236

UNIFORM THERMAL MIGRATION UTILIZING NONCENTRO-SYMMETRIC AND SECONDARY SAMPLE ROTATION

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,675
Int. Cl.² H01L 21/228
U.S. Cl. 148—1.5 13 Claims



1. An improved method for migrating a molten zone through a solid body of semiconductor material comprising the process steps of:

a. selecting a body of single crystal semiconductor material having two major opposed surfaces which are, respectively, the top and bottom surfaces thereof, a predetermined type conductivity, a predetermined level of resistivity, a preferred diamond cubic crystal structure, a preferred planar crystal orientation for at least the top surface which is one selected from the group consisting of (100), (110) and (111), and a first preferred crystal axis and a vertical axis which are each substantially perpendicular to at least the top surface and substantially parallel with each other;

b. depositing a layer of a metal of a predetermined thickness and having a predetermined geometrical configuration on the surface having the preferred planar orientation;

c. placing the body on a supporting surface at a predetermined distance from a vertical axis thereof;

d. rotating the body simultaneously both in a noncentro symmetrical manner about the vertical axis of the supporting surface and about its own vertical axis;

e. heating the body and the deposited metal to a predetermined elevated temperature sufficient to form a melt of a metal-rich semiconductor material on the surface of the body while continuing the simultaneous dual rotation cycle of the body;

f. establishing a temperature gradient substantially parallel with the vertical axis of the body and the first preferred crystal axis of the crystal structure of the material while continuing the simultaneous dual rotation cycle of the body, the surface on which the melt is formed being at the lower temperature, and

g. migrating each melt of metal-rich semiconductor material as a molten zone through the solid body of semiconductor material for a sufficient period of time to reach a predetermined distance into the body from the top surface, while continuing the simultaneous dual rotation cycle of the body, to form in situ at least one region of recrystallized semiconductor material of the body having solid solubility of the deposited metal therein, a substantially uniform cross-sectional area and a substantially uniform level of resistivity throughout the entire region.

4,012,237

ZIRCONIUM MODIFIED NICKEL-COPPER ALLOY

John D. Whittenberger, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 5, 1975, Ser. No. 584,094
Int. Cl.² C22F 1/02
U.S. Cl. 148—2 5 Claims

2. A method of improving the mechanical strength of nickel-copper alloys containing about 30 weight percent copper at elevated temperatures without affecting the oxidation characteristics comprising the steps of

adding about 0.2 weight percent zirconium to said alloys to modify the same,

casting the modified alloys into ingots,

hot rolling said ingots into sheets at about 1450 K,

warm rolling said sheets at about 920 K, and

thermomechanically processing said modified alloy to produce a dispersion of Ni_5Zr precipitates, said thermomechanical processing comprising the steps of

solution treating said sheets for ½ hour at 1365 K in hydrogen, and

annealing said sheets for ½ hour to 3 hours at a temperatue between 1025 K and 1225 K in hydrogen.

4,012,238

METHOD OF FINISHING A STEEL ARTICLE HAVING A BORONIZED AND CARBURIZED CASE

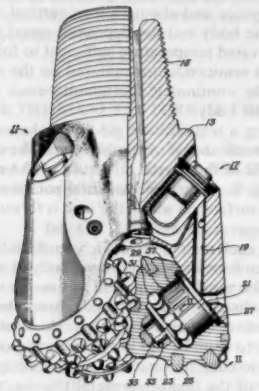
Stanley R. Scales, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 387,566, Aug. 10, 1973, Pat. No. 3,922,038. This application Sept. 25, 1975, Ser. No. 616,537
Int. Cl.² C23C 9/08, 9/00
U.S. Cl. 148—6 7 Claims

1. The method of manufacturing steel friction bearing members requiring a strong and tough wear resistant surface, said method comprising the steps of:

carburizing said surface to produce a carburized case of selected depth;

applying a finish to the carburized surface smoother than the desired final smoothness;



boronizing the carburized case;
hardening the carburized case; and
tempering the carburized case.

4,012,239

PROCESS FOR TREATING STEEL SHEETS FOR THE PURPOSE OF ENAMELLING THE SHEETS

Charles Georges Henri Brun, Montataire, and Philippe Marcel René Tirmarche, Prouvy, both of France, assignors to Union Siserurgique du Nord et de l'Est de la France, par abreviation "USINOR", Paris, France

Continuation-in-part of Ser. No. 418,145, Nov. 21, 1973, abandoned. This application Mar. 6, 1975, Ser. No. 555,923
Claims priority, application France, Nov. 21, 1972, 72.41241; Nov. 7, 1973, 73.39504
Int. Cl.² C23D *3/00*
U.S. Cl. 148—6.3 **18 Claims**

1. Process for treating a steel sheet for the purpose of enamelling same and in particular directly enamelling the sheet with one coat, comprising depositing on the sheet, after rolling the sheet, a coat of a material selected from the group consisting of nickel, cobalt, and mixtures thereof, nickel acetate, nickel nitrate, cobalt acetate, cobalt nitrate and mixtures thereof in an amount of 0.45–20 g/m2 calculated as the elemental metal, annealing the sheet under a decarburizing atmosphere consisting of hydrogen, water vapour and nitrogen, the hydrogen content being 10–75% and the H_2/H_2O ratio being within the range from 3 to 6, to substantially totally decarburize it and, during the cooling step of the annealing cycle, subjecting the coated sheet to the action of an oxidizing atmosphere of hydrogen, water vapour and nitrogen containing 2–7% water vapour and having a H_2/H_2O ratio which is less than 6.

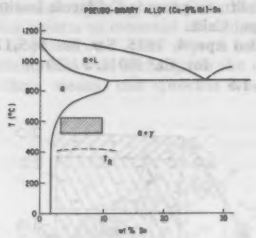
4,012,240

Cu-Ni-Sn ALLOY PROCESSING

Robert Alfred Hinrichsen, Basking Ridge, and John Travis Plewes, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 8, 1975, Ser. No. 620,644
Int. Cl.² C22F *1/08*
U.S. Cl. 148—11.5 C **6 Claims**

1. A method for processing a cast Cu-Ni-Sn ingot consisting essentially of an alloy having a composition of from 3–30% nickel, from 3–10% tin, and remainder copper and which at room temperature is in a two-phase state and which at a temperature significantly higher than room temperature and slightly below the melting temperature of said alloy is in a single-phase state, CHARACTERIZED IN THAT said ingot is worked by an amount corresponding to at least 30 percent area reduction at a temperature at which said alloy is in a two-phase state and which lies above the reversion temperature of said alloy and near the recrystallization temperature of said alloy.



4,012,241

DUCTILE EUTECTIC SUPERALLOY FOR DIRECTIONAL SOLIDIFICATION

Franklin D. Lemkey, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 22, 1975, Ser. No. 570,923
Int. Cl.² C22C *19/03*
U.S. Cl. 148—32 **4 Claims**

1. A directionally solidified nickel alloy article, of essentially eutectic composition having a matrix comprised predominantly of gamma prime (Ni_3Al) and at least 20 volume percent of an alpha (Mo) fibrous second phase in an aligned form.

4,012,242

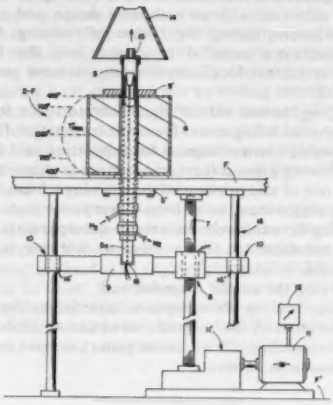
LIQUID EPITAXY TECHNIQUE

Herbert F. Matare, Los Angeles, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Nov. 14, 1973, Ser. No. 415,762
Int. Cl.² H01L *21/208*
U.S. Cl. 148—172 **8 Claims**

1. A method for producing a superior heteroepitaxial semiconductor junction comprising superposing a prescribed doped limited volume unsaturated melt directly upon a host substrate and subjecting the resulting material to a four phase thermal cycle adapted to provide a moving external thermal gradient and a prescribed internal fixed thermal gradiant across the melt-substrate interface; the first phase comprising heating to a temperature such that the substrate is melted back to a prescribed degree and with prescribed diffusion, the dissolved substrate saturating the melt; the second phase comprising cooling at a rate adapted to rapidly arrest melting back of the substrate and terminate upward thermal momentum with attendant supersaturation; the third phase comprising cooling at a rate of 0.1°–1.0° C per minute to initiate slow recrystallization and diffusion; the fourth phase comprising cooling at a rate of 2°–5° C per minute to recrystallize the

entire melt-substrate combination; wherein said limited volume is that volume which will be saturated by the substrate



during melting back; whereby a graded epitaxial junction of a crystal layer having a prescribed volume and stoichiometry with very low dislocation incidence is obtained.

4,012,243

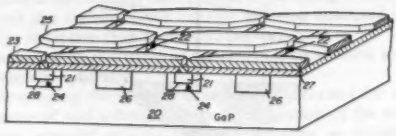
METHOD OF FABRICATING MULTICOLOR LIGHT DISPLAYS UTILIZING ETCH AND REFILL TECHNIQUES

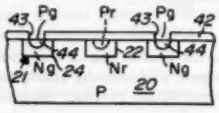
John G. Keil, Scottsdale, and Michael G. Coleman, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 198,221, Nov. 12, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,747

Int. Cl.² H01L *21/20, 21/82, 29/207*

U.S. Cl. 148—175 **3 Claims**





1. A process for the manufacture of a multicolor monolithic light display comprising:

a. etching a first set of channels in a monolithic substrate of one conductivity type;

b. epitaxially filling said channels with a first monocrystalline material containing a first conductivity effecting material of opposite conductivity type;

c. forming regions of said one conductivity type into selected portions of said channel;

d. etching a second set of channels in the surface of said substrate;

e. epitaxially filling said second channels with a second monocrystalline material containing a second conductivity effecting material of said opposite conductivity type;

f. forming regions of said one conductivity type into selected portions of said second channel.

4,012,244

HIGH DENSITY IMPULSE SOLID PROPELLANT

Martin H. Kaufman, and Peter L. Stang, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1961, Ser. No. 99,967

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.3 **5 Claims**

1. A high density solid propellant composition comprising zirconium hydride, ammonium perchlorate and a copolymer of vinylidene fluoride and perfluoropropylene.

4,012,245

CAST TNT EXPLOSIVE CONTAINING POLYURETHANE ELASTOMER WHICH IS FREE FROM OILY EXUDATION AND VOIDS AND UNIFORMLY REMELTABLE

H. William Voigt, Jr., Stanhope, N.J.; Lawrence W. Pell, St. Simon's Island, Ga., and Jean P. Picard, Morristown, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 475,078, May 31, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,798

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.4 **7 Claims**

1. A castable high explosive composition which is essentially free from oily exudation on storage and voids and can be remelted and resolidified essentially without loss of homogeneity and explosive properties, which consists essentially of an explosive component consisting essentially of 2,4,6-trinitrotoluene and up to about 80% by weight of the explosive component of at least one crystalline explosive of the group cyclotrimethylenetrinitramine and cyclotetramethylenetetranitramine, and from about 0.1 to 5 weight percent of a polyurethane elastomer-producing system consisting essentially of an organic polyisocyanate, a hydroxyl-terminated 1,4-butadiene polymer liquid resin of hydroxyl functionality between 2 and 3, and an abietyl alcohol.

4,012,246

SUPER FINE PETN THIN LAYER SLURRY EXPLOSIVE

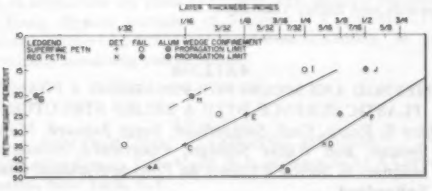
Charles D. Forrest, Hollister, Calif., assignor to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Continuation-in-part of Ser. No. 434,754, Jan. 31, 1974, Pat. No. 3,912,560. This application Oct. 14, 1975, Ser. No. 622,319

The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.² C01B *31/32, 25/32*

U.S. Cl. 149—47 **8 Claims**



1. An improved slurry explosive able to propagate in very thin layers comprising a mixture of, by weight:

A. approximately 15% to 45% by weight of sensitized superfine particle penetaerythritol tetranitrate (PETN), said sensitized particles having an average diameter of approximately 6.5 microns and further comprising interstiticial voids defining a gas phase; and,

B. approximately 45% to 27% by weight of a material selected from the group consisting of ammonium nitrate, potassium, barium and sodium nitrate; and

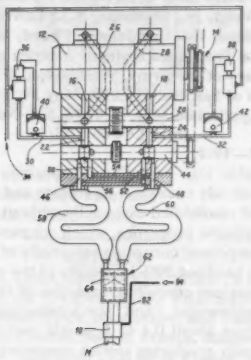
C. approximately 10% by weight of a liquid anti-freeze agent; and
D. approximately 0.5% to 0.7% of a material selected from the group consisting of guar gum and polyacrylamide; and
E. a cross-linking agent; and
F. water.

4,012,247

METHOD AND DEVICES FOR ROAD SURFACE MARKING

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed Jan. 26, 1976, Ser. No. 652,524
Claims priority, application Italy, Jan. 27, 1975, 19621/75
Int. Cl.² E01C *19/00*
U.S. Cl. 156—71 **18 Claims**



1. A method of forming a traffic-regulating indicium on a pavement, comprising forming a primer layer on said pavement by applying thereto a fluid composition which includes cross-linkable components, said composition having such a viscosity upon application thereof to said pavement that said composition intimately contacts said pavement, and said composition being capable of rapidly attaining a viscosity in the range of about 10^3 to 10^4 cP when said composition has a viscosity below said range upon being applied to said pavement, said composition further being capable of undergoing an increase in viscosity on said pavement from said range to a higher viscosity of at least 10^5 cP within a few minutes; and applying a marker tape to said primer layer when the viscosity thereof is approximately in said range to thereby preliminarily bond said marker tape to said primer layer, said marker type becoming more securely bonded to said primer layer as the viscosity of said primer layer increases from said range towards said higher viscosity.

4,012,248

METHOD AND MEANS FOR PROVIDING A FOAMED PLASTIC SURFACE WITH A RELIEF STRUCTURE

Björn S. Rump, Genf, Switzerland; Bengt Johnard, Mondal, Sweden, and Walter Schlegel, Oberrieden, Switzerland, assignors to Societe d'Etudes du Procede Noridem, Glarus, Switzerland

Filed May 24, 1973, Ser. No. 363,609
Claims priority, application Switzerland, May 24, 1972, 7640/72
Int. Cl.² B32B *3/00, 5/20, 31/00*
U.S. Cl. 156—79 **24 Claims**

1. An article for simultaneously providing one side of a foamable substrate with an embossed design and a colored pattern in coincidence with said embossed design, comprising a preform including a non-foamable transparent film and a removable carrier material for supporting said film, said film having printed thereon a pattern in printing inks, at least one of said printing inks containing a foam inhibitor/accelerator material.

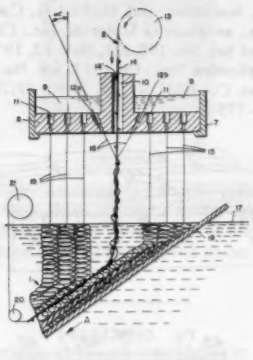
7. In a process for simultaneously providing one side of a foamable substrate with an embossed design and a colored pattern, wherein, during the course of foaming, foam inhibitor/accelerator material penetrates into the foamable substrate at certain locations, the improvement comprising the steps of:
a. applying, to one side of the substrate to be foamed, a preform including a non-foamable transparent film and a removable carrier material for supporting said film, said film having printed thereon a pattern in printing inks, at least one of said printing inks containing a foam inhibitor/accelerator material to form a composite material;
b. heating the composite material to a temperature at which said non-foamable film adheres to said one side of the foamable substrate;
c. removing the carrier material; and
d. further heating the composite material to the foaming temperature of the substrate to obtain an embossed design coinciding with a colored pattern on said one side of the foamable substrate.

4,012,249

REINFORCED MATTING AND A PROCESS AND APPARATUS FOR ITS PRODUCTION

Hans Stapp, Momlingen, Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed July 3, 1975, Ser. No. 593,054
Claims priority, application Germany, July 3, 1974, 2431871
Int. Cl.² D04H *3/16*
U.S. Cl. 156—167 **14 Claims**



1. A process for the production of a reinforced matting of melt-spun, interlooped, substantially amorphous and continuous synthetic thermoplastic polymer filaments which comprises:
conducting a continuous band of a flat, latticed structure as a reinforcing member downwardly into and then through a liquid cooling bath;
simultaneously melt-spinning a plurality of said thermoplastic polymer filaments downwardly toward said bath to form interlooped filaments adhering to each other at random overlapping points of intersection, said spinning taking place from at least two rows of spinning orifices disposed adjacently on either side of said reinforcing member;
applying at least part of the freshly spun filaments onto both sides of said reinforcing member by directing adjacent filaments on either side thereof at an angle inclined from the vertical direction to impinge upon and randomly penetrate said reinforcing member above the bath surface; and
completely solidifying the freshly spun filaments only after

their entry into said cooling medium such that in a bath zone near the surface of the cooling medium the filaments remain sufficiently tacky to adhere to each other at their overlapping points of intersection.

12. Apparatus for the production of a continuous reinforced matting of melt-spun thermoplastic filaments comprising:

a spinning head mounted vertically above a cooling bath and having a central feed slot extending therethrough in the spinning direction to permit the passage of a latticed reinforcing sheet downwardly toward the bath surface;

means to conduct said reinforcing sheet continuously from a feed supply through said feed slot and into said cooling bath; and

at least one row of spinning nozzles in said spinning head located on each side of and directly adjacent the feed slot, at least part of the nozzles in each row adjacent the feed slot being inclined at an angle of about 10° to 70° from the vertical to direct the melt-spun filaments onto the reinforcing sheet at a point above said bath surface under a force sufficient to permit loops of the filaments to penetrate the latticed structure of the sheet.

4,012,250
IMAGING SYSTEM

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 2, 1970, Ser. No. 77
Int. Cl.² G03G *13/22*
U.S. Cl. 96—1 PS 12 Claims

1. An imaging method comprising the steps of:

a. providing an imaging member comprising a substantially electrically insulating softenable layer containing migration material, said migration material comprising a dye, said softenable layer capable of having its resistance to migration of said migration material decreased sufficiently to allow migration of said migration material in depth in said softenable layer, said softenable layer overlying a dye transfer layer which is overlying a substrate, said dye transfer layer capable of being rendered more dye receptive than said substrate;

b. applying an electrical imagewise migration force to said migration material;

c. developing the softenable layer by decreasing the resistance of said softenable layer to migration of the migration material at least sufficient to allow an imagewise migration of migration material to said dye transfer layer; and

d. rendering said transfer layer dye receptive whereby said dye material dyes said transfer layer.

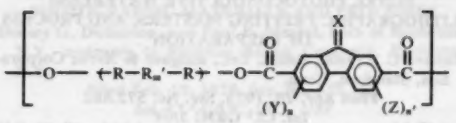
4,012,251
MULTI-LAYERED PHOTOCONDUCTIVE MEMBER

Sam R. Turner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 22, 1975, Ser. No. 580,119
Int. Cl.² G03G *5/06, 5/04, 5/08*
U.S. Cl. 96—1 PC 18 Claims

1. An electrophotographic imaging member having a composite photoconductive insulating film wherein one layer of said film comprises a photoconductive material capable of substantial spectral response in the visible region of the electromagnetic spectrum and a second layer of electronically active insulating polymer contiguous with said photoconductive layer,

said electronically active insulating polymer comprising recurring structural units of the formula:



wherein

X is oxygen or dicyanomethylene;

Y and Z are independently selected from the group consisting of NO_2, halogen, —CN and $—CF_3$;

R is a hydrocarbylene radical having from 1 to 10 carbon atoms;

R′ is oxygen or sulfur;

m is 0 or 1; and

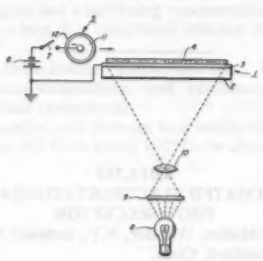
n and *n′* can range from 0 to 3

said electronically active insulating polymer film being transparent, capable of facile transport of electrons which are injected into it upon photoexcitation of the contiguous photoconductive layer and incapable of substantial spectral response within the wavelength of spectral response of the photoconductive layer.

4,012,252
IMAGING PROCESS UTILIZING 3-BROMO-N-2″-PYRIDYL-8,13-DIOXODINAPHTHO-(2,1-b; 2′,3′-d)-FURAN-6-CARBOXAMIDE

Robert J. Gruber, Pittsford, and Nicholas J. Germano, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 411,596, Oct. 29, 1973. This application Sept. 30, 1975, Ser. No. 618,299
Int. Cl.² G03G *17/04*
U.S. Cl. 96—1 PE 4 Claims



1. A suspension for photoelectrophoretic imaging comprising finely divided particles of 3-bromo-N-2″-pyridyl-8,13-dioxodinaphtho-(2,1-b;2′,3′-d)-furan-6-carboxamide in an electrically insulating carrier liquid.

4,012,253
HOLOGRAPHIC RECORDING MEDIUM

Robert Allen Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 309,754, Nov. 27, 1972, abandoned. This application Oct. 16, 1974, Ser. No. 515,369
Int. Cl.² G03G *5/00, 5/10;* G03C *5/04*
U.S. Cl. 96—1.5 3 Claims

1. A medium for recording and erasing phase holograms in the form of a surface relief pattern consisting essentially of in sequence an electrically conductive substrate, a photoconductive insulating layer, a transparent, polar, barrier layer, and an electrically alterable storage layer consisting essentially of a linear, microcrystalline hydrocarbon polymer having a molecular weight in the range from about 300 to about 2000.

4,012,254

NOVEL PHOTOCONDUCTIVE WATERLESS LITHOGRAPHIC PRINTING MASTERS, AND PROCESS OF PREPARATION

Richard G. Crystal, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1975, Ser. No. 572,682
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 12 Claims

1. A process for preparing a nonimaged photoconductive waterless lithographic printing master comprising providing a heterogeneous copolymer containing an abhesive species of polysiloxane groups and an imaging material adhesive species of organic thermoplastic groups, providing a solvent which will preferentially dissolve one of said species, placing said copolymer in said solvent wherein the nonsoluble species forms micelles, providing a photoconductive pigment and dispersing said pigment in the resultant solution, providing a suitable master substrate and coating the resultant suspension on said master substrate, and allowing the solvent to evaporate whereby the soluble species forms the matrix in which the pigment is dispersed.

12. A photoconductive nonimaged waterless lithographic printing master comprising:

a. a suitable master substrate, and

b. a heterogenous copolymer adhered to said substrate comprising an abhesive species formed of abhesive polysiloxane groups which can be cured or coalesced to an ink releasable elastomeric condition and an imaging material adhesive species formed of organic thermoplastic blocks which can be alternately softened such as by heat and/or solvent, and hardened so as to bond a particulate imaging material thereto, said adhesive species containing an activating amount of photoconductive particles dispersed therein.

4,012,255

OVERCOATED ELECTROSTATOGRAPHIC PHOTORECEPTOR

Thomas B. McMullen, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 6, 1976, Ser. No. 683,987
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 9 Claims

1. An improved electrostatographic photoreceptor which comprises:

a. a conductive substrate;

b. a layer of an alloy of selenium and arsenic as photoconductive insulating material in operative contact with the conductive substrate; and

c. an overcoating uniformly covering the exposed surface of said photoconductive material, the overcoating comprising:

I. an organic material comprising a crosslinkable polymeric composition of:

i. a first polymer which is the addition polymerization product of methyl methacrylate, n-butylacrylate and acrylic or methacrylic acid, and

ii. a second polymer which is the addition polymerization product of styrene and maleic anhydride, together with

II. a particulate wax-like, normally solid, low molecular weight tetrafluoroethylene telomer in an amount from about 15 to 75 weight percent of said overcoating.

4,012,256

PHOTO-IMAGING UTILIZING ALKALI-ACTIVATED PHOTOPOLYMERIZABLE COMPOSITIONS

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Sept. 25, 1972, Ser. No. 291,851
Int. Cl.² G03C 5/00, 1/68
U.S. Cl. 96—35.1 4 Claims

1. The method of forming a polymeric image which comprises:

a. providing photo-imaging material comprising a support and a coating thereon of a composition comprising an ethylenically unsaturated polymerizable compound, a photo-initiator comprising the combination of a photoreducible dye and an alkanolamine, and sufficient acid to normally maintain said composition at a pH value below about 4.5, thereby rendering said material substantially insensitive to visible light;

b. alkalizing at least a section of the coated composition of said material to render the pH value of said composition section greater than about 7.0; and

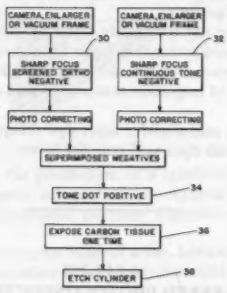
c. exposing imagewise to visible light said alkalized composition section, thereby effecting polymerization of said composition in light-exposed areas.

4,012,257

METHOD OF PRODUCING A GRAVURE PRINTING SURFACE UTILIZING A CONTINUOUS AND SCREENED NEGATIVE

Frank T. Geris, 2900 Maple Ave., Downers Grove, Ill. 60515

Continuation-in-part of Ser. No. 516,171, Oct. 21, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 658,028
Int. Cl.² G03C 5/00
U.S. Cl. 96—36.4 20 Claims



1. A method of producing a gravure printing surface comprising the steps of:

a. photographically producing a continuous tone negative in sharp focus;

b. photographically producing a grey screened negative on orthochromatic film also in sharp focus;

c. superimposing the continuous tone and screened negatives in register;

d. producing a tone dot positive from the superimposed negatives; and

e. producing said gravure printing surface from said positive by exposing a carbon tissue resist and etching in the conventional manner.

4,012,258

PROCESS FOR FORMING COLOR PHOTOGRAPHIC IMAGES

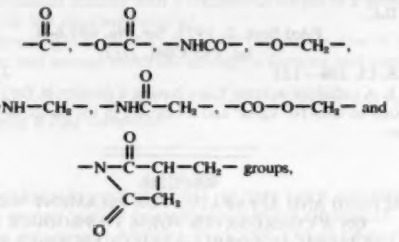
Tamotsu Kojima; Shui Sato; Wataru Fujimatsu; Hiroyuki Imamura, and Takaya Endo, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1975, Ser. No. 568,054
Claims priority, application Japan, Apr. 12, 1974, 49-41465
Int. Cl.² G03C 7/00
U.S. Cl. 96—55 5 Claims

1. A method of processing an exposed light-sensitive silver halide color photographic material by a developer, which method comprises conducting said processing in the presence of a coupler represented by the following formula

$$A - X - C_nF_{2n}H$$

wherein A is the residue of a coupler which is selected from the group consisting of benzoylacetanilide and pivaloylacetanilide yellow couplers, 1-phenyl-5-pyrazolone, indazolin-3-one and pyrazolo-benzimidazole magenta couplers, and phenol and naphthol cyan couplers; X is a biradical which is selected from the group consisting of



provided that the left bond of the group is attached to A while the right bond is connected to $-C_nF_{2n}H$; and n is an integer of 1 to 18 inclusive; further provided that X is not —NHCO— of which N is attached to A when the following three conditions are simultaneously met, one of the conditions being that A is a phenol or naphthol cyan coupler residue, another being that the hydrogen atom of $-C_nF_{2n}H$ is at the ω-position thereof, the other being that *n* is an even number of 2 to 14.

4,012,259

PHOTOGRAPHIC SILVER HALIDE EMULSION AND ELEMENT AND METHOD OF FORMING COLOR PHOTOGRAPHIC IMAGES

Akio Okumura; Akira Sato; Seiji Ichijima; Keisuke Shiba, and Kiyoshi Nakazyo, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 14, 1974, Ser. No. 469,923
Claims priority, application Japan, May 16, 1973, 48-54456
Int. Cl.² G03C 7/00, 1/40
U.S. Cl. 96—56.5 35 Claims

1. A method of forming color photographic images which comprises developing an image-exposed photographic silver halide emulsion layer with a primary aromatic amino developing agent in the presence of a yellow color forming coupler, said coupler having an open chain active methylene group bonded to two adjacent carbonyl groups, one of the hydrogen atoms of the active methylene group being substituted by a 2,5-dioxo-1-imidazolidinyl group, in which the nitrogen atom at the 3-position and the carbon atom at the 4-position are connected to form a ring through a divalent aliphatic group having 3 or 4 carbon atoms.

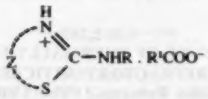
4,012,260

ACTIVATOR-STABILIZERS IN HEAT DEVELOPABLE PHOTOGRAPHIC MATERIALS AND PROCESSES

Dorsey G. Dickerson, and Paul B. Merkel, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 19, 1975, Ser. No. 551,182
Int. Cl.² G03C 1/02, 1/48
U.S. Cl. 96—114.1 14 Claims

1. A heat-developable and heat-stabilizable photographic element comprising a support having thereon in reactive association a photographic silver salt, a photographic silver salt developing agent and a stabilizing concentration of an activator-stabilizer represented by the formula:



wherein

Z is alkylene having 2 to 3 carbon atoms in the alkylene chain,

R is hydrogen, alkyl containing 1 to 3 carbon atoms, cycloalkyl containing 5 to 6 carbon atoms, or aralkyl containing 7 to 10 carbon atoms,

R^1COO^- is an acid anion which is decarboxylatable at temperatures above about 80° C., and tautomers corresponding to said activator-stabilizer.

13. A method of developing and stabilizing an image in a heat-developable and heat-stabilizable photographic element comprising a support having thereon a layer comprising photographic silver halide, a polymeric binder, a silver halide developing agent and a stabilizing concentration of an activator-stabilizer which is a compound selected from the group consisting of

2-amino-2-thiazolinium trichloroacetate, bis(2-amino-2-thiazolinium)oxalacetate, and combinations of these thiazolinium compounds,

comprising heating said element to a temperature within the range of about 90° C. to about 160° C. for about 1 to about 4 seconds.

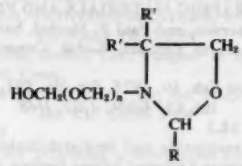
4,012,261

BIOCIDAL COMPOSITIONS CONTAINING MONOCYCLIC POLYOXYMETHYLENEOXAZOLIDINES

Henri Sidi, Paramus, and Hilding R. Johnson, Wayne, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 519,884, Oct. 31, 1974, Pat. No. 3,962,271, which is a division of Ser. No. 447,797, March 4, 1974, Pat. No. 3,890,264. This application Sept. 4, 1975, Ser. No. 610,194
Int. Cl.² C09D 5/14; A01N 9/28
U.S. Cl. 106—15 R 6 Claims

1. A biocidal composition for use in controlling the growth of bacteria and fungi in aqueous surface-coating compositions that is an aqueous solution containing 20 percent to 80 percent by weight of a biocidal component that comprises a monocyclic polyoxymethyleneoxazolidine having the structural formula



wherein R represents hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, halophenyl, or $-(CH_2)_mCH_2OH$; each R′ represents alkyl of 1 to 6 carbon atoms or $-CH_2OH$; *m* represents a number in the range of 0 to 2; and *n* represents a number in the range of 1 to 4.

4,012,262

MANUFACTURE OF THERMALLY-INSULATING, REFRACTORY ARTICLES

Denis Arthur John Patterson, "The Cottage", Newbridge Green, Upton-on-Severn, Worcestershire, and Thomas Albert Williams, "Fairways", Mill Lane, Blakedown, Kidderminster, Worcestershire, both of England

Filed Feb. 8, 1974, Ser. No. 440,704

Int. Cl.² B28B *7/36*

U.S. Cl. 106—38.22 **33 Claims**

1. A molding composition for the manufacture of thermally insulating refractory articles, comprising a liquid, about 1 to 20 percent by weight on a dry basis of organic fibrous material and about 60 to 95 percent by weight on a dry basis of particulate refractory material, the liquid being present in an amount such that the composition is of plastic consistency and has a minimum apparent viscosity of about 200,000 centipoises at a temperature of 25° C.

4,012,263

ALKALI-FREE GLASSES

James Allen Shell, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 10, 1975, Ser. No. 548,264

Int. Cl.² C03C *3/04*

U.S. Cl. 106—52 **12 Claims**

1. A glass composition containing SiO_2, Al_2O_3, CaO and BaO and consisting essentially of compositions selected alternatively from one of the group of compositional ranges A and B below:

COMPOSITIONAL RANGE A

COMPONENTS	PERCENT BY WEIGHT
SiO_2	50–52.1
Al_2O_3	8–10.9
CaO	8.7–11.1
BaO	26.6–30.3

COMPOSITIONAL RANGE B

COMPONENTS	PERCENT BY WEIGHT
SiO_2	52.8–59
Al_2O_3	10.9–14.1
CaO	7.7–14.4
BaO	15.5–26.6
MgO	0–2.4

4,012,264

EARLY STRENGTH CEMENTS

Ransom James Murray, Gravesend, and Arthur William Brown, London, both of England, assignors to The Associated Portland Cement Manufacturers Limited, London, England

Continuation of Ser. No. 386,625, Aug. 8, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,881

Claims priority, application United Kingdom, Aug. 16, 1972, 38202/72

Int. Cl.² C04B *7/02, 7/32*

U.S. Cl. 106—89 **12 Claims**

1. An early strength hydraulic cement comprising a mixture of a cement prepared from a clinker rich in $C_{12}A_7$ and poor in other calcium-aluminum compounds such as CA or C_3A with a Portland cement, said mixture including at least 10% by weight of $C_{12}A_7$, a majority of the balance comprising calcium silicates and including at least 10% by weight of C_3S.

4,012,265

LOW-DENSITY MICROCELLULAR FOAM AND METHOD OF MAKING SAME

James A. Rinde, Livermore, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 2, 1975, Ser. No. 609,641

Int. Cl.² C08L *1/12*

U.S. Cl. 106—122 **2 Claims**

1. A cellulose acetate foam having a density in the range of 0.065 to 0.6×10^3 kg/m³ and a cell size in the range of 0.3 to 2 μm.

4,012,266

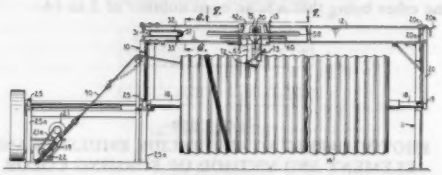
METHOD AND APPARATUS FOR FILAMENT WINDING ON A CORRUGATED FORM TO PRODUCE A CYLINDRICAL CORRUGATED GLASS FIBER PART

Donald L. Magee, Rte. 8, Lincoln, Nebr. 68506; Walter A. Bailey, 3440 N. 66th St., Lincoln, Nebr. 68507, and Roger P. Bailey, 4131 Clifford Drive, Lincoln, Nebr. 68506

Continuation of Ser. No. 282,255, Aug. 21, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,547

Int. Cl.² B65H *81/00*

U.S. Cl. 156—173 **8 Claims**



1. The method of filament winding on a cylindrical form to thereby form a cylindrical part, said method including the steps of

causing relative motion between said form and a glass fiber applicator,

continuously delivering liquified resin and catalyst to a receptacle to combine the resin and catalyst,

applying said combined liquified resin and catalyst in said receptacle to a glass fiber band,

varying the proportional amount of catalyst to resin that is applied to said glass fiber band at preselected times during the filament winding operation,

wrapping said glass fiber band with said resin catalyst combination coating thereon on said form in a spiral pattern,

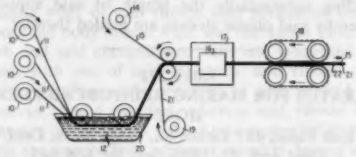
permitting said glass fiber to harden on said form thereby forming said cylindrical part, and

removing said hardened part from said form after a predetermined period of time.

4,012,267
PROCESS FOR PRODUCING PULTRUDED CLAD COMPOSITES

Theodore Harold Klein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 10, 1975, Ser. No. 594,580
Int. Cl.² B29G 7/00; B32B 15/14
U.S. Cl. 156—178 12 Claims



1. A continuous process for forming a composite of a fibrous first material clad with at least one second metal foil cladding material comprising:

a. impregnating a continuous length of a fibrous first material with a contracting liquid resin,

b. combining the impregnated fibrous first material in a continuous manner with a continuous length of a second metal foil cladding material,

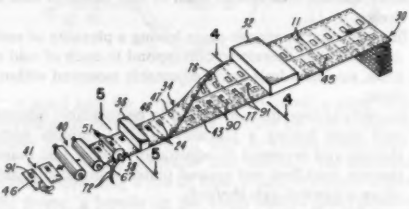
c. pultruding in a continuous manner the combination of the first and second materials through a forming and curing die,

thereby continuously and simultaneously forming and fully curing a clad composite.

4,012,268
CONTINUOUS BUSINESS FORM OR THE LIKE ADAPTED FOR SUBSEQUENT PROCESSING INTO ORIGINAL INDICIA BEARING LOTTERY TICKETS, ENVELOPES OR THE LIKE

Edward L. Johnsen, 12 Fox Meadow Lane, Wayland, Mass. 01778

Division of Ser. No. 433,463, Jan. 15, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,231
Int. Cl.² B31F 1/00
U.S. Cl. 156—200 11 Claims



1. A method of producing a series of interconnected blanks suited for processing into individual envelopes, lottery tickets or like articles having an under ply containing original, directly applied indicia on one surface thereof and a cover ply disposed in substantial overlying relationship with said under ply, concealing selected portions of said indicia, comprising the steps of:

a. continuously advancing an endless web of material toward an accumulating station;

b. transversely subdividing said web into a series of interconnected blanks, the width of each of which is defined by at least two longitudinal, contiguous, coplanar panels which collectively define the cover ply and under ply panels of the article;

c. selectively applying an adhesive to a surface of one of the plys to be positioned adjacent at least two sides of the concealed portion thereby generally surrounding the concealed portion for positioning the indicia in a pocket area which is substantially completely and permanently sealed to the cover ply in a manner such that improper access to the pocket area is impractical;

d. accumulating said series of interconnected blanks for further processing, and thereafter;

e. continuously advancing said interconnected blanks toward an indicia applying station;

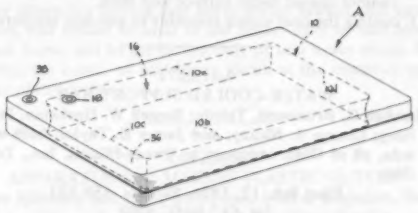
f. applying original indicia directly to an upper surface of the under ply panel; and

g. continuously folding and activating the adhesive for substantially permanently bonding said cover ply panel in substantial overlying relationship with said under ply panel thereby positioning the concealed portions of the indicia in the pocket area, and completing a series of interconnected envelopes, lottery tickets or like articles each having indicia concealed inside a substantially completely and permanently sealed pocket area.

4,012,269
METHOD OF MAKING A WATER BED

John D. Tabata, Los Angeles; Enrique Cantillo, Santa Ana, and Frank M. Tabata, Los Angeles, all of Calif., assignors to American Thermo-Seal, Inc., Los Angeles, Calif.

Division of Ser. No. 470,956, May 17, 1974, Pat. No. 3,918,110. This application Oct. 17, 1975, Ser. No. 623,467
Int. Cl.² B32B 31/00
U.S. Cl. 156—251 16 Claims



1. A method of making a generally rectangularly shaped water bed mattress for supporting a body thereon and where said mattress comprises upper and lower generally rectangular walls, with a first continuous inner wall of generally rectangular configuration extending between said upper and lower walls and forming a water chamber therebetween, and a second continuous peripheral wall of generally rectangular configuration located outwardly of said first continuous wall and which is in spaced apart relationship therefrom, thereby forming an air chamber between portions of said upper and lower walls and said first continuous inner wall and second continuous peripheral wall and which air chamber surrounds said water chamber; said method comprising forming an an inner continuous peripheral wall from a plurality of upstanding sections which are connected at corner margins by permanently formed arcuate segments which are permanently convex to said water chamber, forming a first water tight lap seal securing said upper wall to the upper margin of said continuous inner wall continuously along the entire peripheral length thereof, forming said first continuous inner wall with said upstanding wall sections having a sufficient amount of material so that all wall sections of said inner wall are permanently convex to said water chamber and with said upper and lower margins thereof being permanently spaced outwardly from said water chamber with respect to a midpoint of said upstanding wall sections located between said upper and lower margins, and where the upper and lower margins of said arcuately shaped corner margins are also spaced outwardly from said water chamber with respect to the midpoints of said arcuate segments forming said corner margins.

4,012,270
METHOD OF IMPROVING THE ADHESION OF PROPYLENE POLYMERS TO ENAMEL COATED METAL SURFACES

Chester W. Fitko, Chicago, Ill., assignor to The Continental Group Inc., New York, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,513
Int. Cl.² C09J 5/00
U.S. Cl. 156—306 **15 Claims**

1. A method of heat sealing a propylene polymer to a metal surface which comprises;

a. preparing a solution of a carboxyl modified polypropylene resin by dissolving an adhesion promoting amount of the resin in a solvent heated to a temperature greater than 100° C, the solvent being selected from the group consisting of saturated and olefinic unsaturated aliphatic acids and alcohols having 10 to 22 carbon atoms and saturated and unsaturated hydrocarbons having 10 to 30 carbon atoms,

b. adding the resin solution to an enamel coating formulation so that the modified enamel coating formulation is comprised of a solids mixture of about 60 to about 95% by weight of an epoxy resin about 5 to about 40% by weight of a urea formaldehyde resin and about 0.01 to about 5% by weight of the carboxyl modified polypropylene resin,

c. applying the modified coating formulation to the metal surface,

d. baking the modified coating formulation to cure and harden the coating,

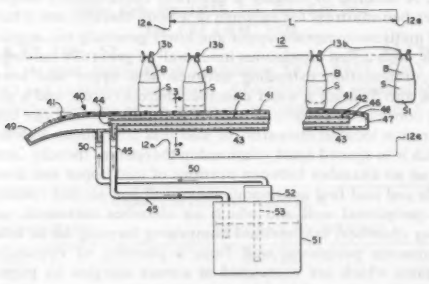
e. heat sealing a propylene polymer layer to the hardened enamel coated metal surface and then,

f. cooling the heat sealed assembly to ambient temperature.

4,012,271
WATER-COOLED SUPPORT BAR

Marshall G. Brummett, Toledo; Russell W. Heckman, Perrysburg; George A. Nickey, and James E. Taylor, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 17, 1976, Ser. No. 658,631
Int. Cl.² B65C 9/00
U.S. Cl. 156—423 **14 Claims**



12. In an apparatus for shrinking tubular sleeves of heat shrinkable thermoplastic onto glass containers, the combination comprising an elongated oven enclosure open at its opposite ends to define the entrance and exit thereto and operable for heat shrinking said thermoplastic sleeves in snug fitting surface relationship on said glass containers during movement through the oven, a conveyor having spaced apart chucks thereon supporting glass containers in an upright position, the containers having loose fitting tubular sleeves of said thermoplastic positioned thereon to depend a predetermined amount below the bottom of the containers, said conveyor travelling in a path extending longitudinally through said oven enclosure.

a horizontally extending elongated support bar mounted below the path of said conveyor, a portion thereof extending outwardly from said oven entrance and the remaining portion extending into the oven, the uppermost surface of said support bar adapted to engage the bottom edge of the sleeves positioned on the containers and maintain that position until shrunken onto the containers.

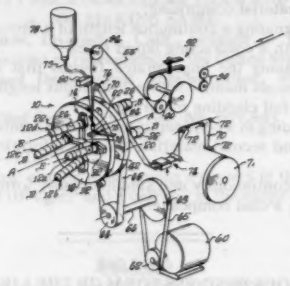
a cooling means connected to said support bar to maintain the uppermost surface thereof at a temperature to avoid sticking of the plastic sleeves engaged theeon, and

a friction reducing coating on said uppermost surface extending substantially the length of said support bar, whereby said plastic sleeves are guided thereby.

4,012,272
APPARATUS FOR MAKING REINFORCED FLEXIBLE HOSE

Larkin Hall Tiner, 487 Esther St., Costa Mesa, Calif. 92627

Filed Aug. 22, 1975, Ser. No. 606,869
Int. Cl.² B65H 81/04
U.S. Cl. 156—429 **3 Claims**



1. An apparatus for continuously forming a flexible reinforced, tubular hose from a continuous, flexible plastic ribbon, and including therein a continuous spring wire, comprising, in combination:

at least four cylindrically-shaped mandrels having a mandrel head provided with a plurality of spaced-apart annular grooves disposed therein and a mandrel shaft connected at one end thereof;

a drive spindle attached to each of said shafts of said mandrels;

a first stationary carriage plate having a plurality of radially disposed slots therein to correspond to each of said mandrels, said mandrels being adjustably mounted within said slots;

a second carriage plate arranged to be rotatably adjustable, said plate having a plurality of slots radially disposed therein and arranged to adjustably receive said mandrels therein, said first and second plates being axially aligned along a central axis thereof;

means for adjusting said mandrels in said first and second plates, whereby each of said mandrels is simultaneously arranged to form a skewered, offset arrangement relative to the central axis of said plates, and whereby said grooves of each mandrel are progressively offset from the grooves of the preceding mandrel in a clockwise directon, wherein each longitudinal axis of each mandrel in arranged and fixed in an oblique direction with respect to that of said central axis of said carriage plates thereby forming a circumferential, convoluted configuration of said flexible hose, and whereby said hose is fed outwardly from said mandrel substantially along said central axis of said plates and wherein said means for adjusting said mandrels comprise:

an adjustable block member slidably received in each slot of each carriage plate;

a floating, bearing means mounted to said shafts of said mandrels and supported within each block member; and

adjustable positioning means connected between said block and said plates whereby said block is located in said slots;

drive means connected to each of said mandrels whereby said mandrels are individually driven in a relatively synchronous relationship to each other;

means for rotatably adjusting said second mandrel about said central axis thereof, whereby said mandrels are simultaneously and equally adjusted to their respective positions;

guide means for guiding the border of the longitudinal, leading edge of said ribbon into peripheral disposition about the body of said wire, and thereafter directing said web and said encapsulated wire into tangential engagement with one of said mandrels, said ribbon and wire being simultaneously received in one of said annular grooves in said mandrel, wherein said ribbon and said wire are progressively guided into tangential engagement with the succeeding, adjacent mandrel having a groove offset with respect to that of the first groove of the initially engaged mandrel, said engagement being successively and sequentially repeated on each adjacent mandrel; and

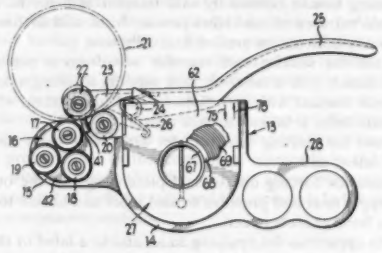
a bonding-agent applicator means arranged to apply a bonding agent to said ribbon prior to said ribbon engaging said mandrels, whereby said ribbon is integrally bonded to itself in a convoluted manner, thereby forming an integral, elongated, flexible hose.

4,012,273

HAND OPERATED TAPE WRAPPER

Egons Inka, Chicago, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed Nov. 6, 1975, Ser. No. 629,280
Int. Cl.² B65H *81/00*
U.S. Cl. 156—490 **4 Claims**



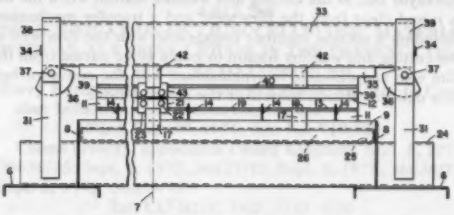
1. A hand tool for wrapping tape around a pipe, said tool comprising an elongated frame, means on the frame for removably holding a supply of tape in coiled form, said tape supply comprising a dispenser and means in the dispenser for rotatably supporting a roll of tape, a pair of rollers at one end of the frame, a handle on the other end of said frame, other means on the frame for supporting said rollers for rotation thereon about parallel axes, a lever pivotally attached to said frame at a location between said pair of rollers and said handle to hold said frame and lever in substantially parallel relationship to one another, a roller at one end of said lever adjacent said pair of rollers rotatable about an axis parallel with the axes of said pair of rollers, a handle at the other end of said lever aligned with and spaced from said frame handle, and means for resiliently urging said lever roller toward and between said pair of rollers whereby squeezing the handles together separates the lever roller from said pair of rollers, one end of said pipe being insertable between said lever roller and said pair of rollers, said tape from said tape supply being insertable between said pipe and said pair of rollers to be pressed against said pipe by said resiliently urged lever roller, and means on said tape supply dispenser for cutting off a piece of tape from said roll of tape.

4,012,274

SPLICER FOR HEAT COHERING BELTS

Nils Lang-Ree, Los Altos, Calif., assignor to N.P.I. Corporation, Burlingame, Calif.

Filed Oct. 17, 1975, Ser. No. 623,366
Int. Cl.² B30B *15/06, 15/34;* B65H *69/08*
U.S. Cl. 156—502 **3 Claims**



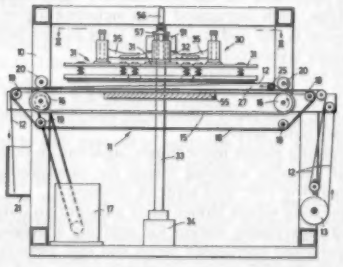
1. A splicer for heat cohering belts comprising a base including an elongated lower platen frame; a lower, flexible elongated platen on said lower platen frame, said lower platen being a thermally conducting bar having transverse gaps extending partially therethrough from the bottom thereof; a first heater in said lower platen; an elongated upper platen frame; an upper, rigid, elongated platen on said upper platen frame; a second heater in said upper platen; means including a shaft rotatable on said base and a cam fixed on said shaft and engaging said upper platen frame for moving said upper platen toward and away from said lower platen; means including a bail fixed on said shaft for holding said upper platen in a fixed position; an expansible means between said base and said lower platen for forcing said lower platen toward said upper platen, and means secured to the center only of said lower platen frame and to the center only of said lower platen for holding the center of said lower platen at the center of said lower platen frame.

4,012,275

APPARATUS FOR MAKING PLASTIC GLOVES

Sören Sjöholm, and Einar Andersson, both of Lesjofors, Sweden, assignors to Parena Plast AB, Lesjofors, Sweden

Filed Jan. 20, 1976, Ser. No. 650,609
Claims priority, application Sweden, Feb. 4, 1975, 7501199
Int. Cl.² B32B *31/00;* B26D *7/06*
U.S. Cl. 156—515 **8 Claims**



1. Apparatus for making a glove from a double thermoplastic film web, comprising a conveyor mechanism for intermittently advancing a double thermoplastic film web along a feed path through a cutting and welding station, said conveyor mechanism including an endless conveyor belt and means for maintaining the film web in constant engagement with the conveyor belt at two locations along the feed path on opposite sides of the cutting and welding station; a flat web-supporting bed disposed at the cutting and welding station below the feed path; a cutting and welding tool disposed at the cutting and

welding station at a level above the feed path and the web-supporting bed and having a vertically movable, heated die formed to the shape of the glove to be made and a mechanism for lowering the die into contact with the film web and for raising the die clear of the film web after the web has been cut and welded by the die; said conveyor mechanism including spacing means for keeping the film web spaced above the conveyor belt at the cutting and welding station when the die is raised clear from the film web; and a transfer mechanism including a suction member engageable with the film web at the cutting and welding station to grip a glove parted from the film web and movable in synchronism with the conveyor belt to a delivery station to deliver the gripped glove.

4,012,276

APPARATUS FOR THE MANUFACTURE BY MACHINE OF MULTILAYER CORRUGATED PAPER MATERIAL

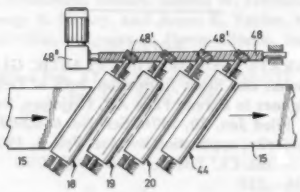
Manfred K. Schertler, Neuburg, Danube, Germany, assignor to Kartonagen. Schertler, Manfred K. Schertler & Co., Neuburg, Danube, Germany

Filed May 28, 1975, Ser. No. 581,639

Claims priority, application Germany, Nov. 11, 1974, 2453297

Int. Cl.² B31F *5/00*

U.S. Cl. 156—558 **11 Claims**



1. An apparatus for the manufacture of laminated corrugated strips, each corrugated strip including a pair of planar paper outer layers and corrugated layer means between said outer paper layers, comprising:

a cold setting, waterproof adhesive;

adhesive applying means for applying a layer of said cold setting, waterproof adhesive on one of said pair of planar paper outer layers;

superposing means immediately adjacent an output end of said adhesive applying means for superposing a corrugated strip onto said layer of adhesive;

compressing means immediately adjacent an output end of said superposing station for applying a pressure to said superposed corrugated strips and said adhesive layer to elastically deform the corrugations in said corrugated layer means whereby a waterproof barrier is created between said superposed corrugated strips, said compressing means including a plurality of motor-driven roller pairs arranged one behind the other and including means for adjusting the spacing between said roller pairs, the rollers of said roller pairs being skewed with respect to the path of movement of said laminated corrugated strips through said compressing means; and

conveying means for conveying said corrugated strips to said adhesive applying means, said superposing means and said compressing means.

4,012,277

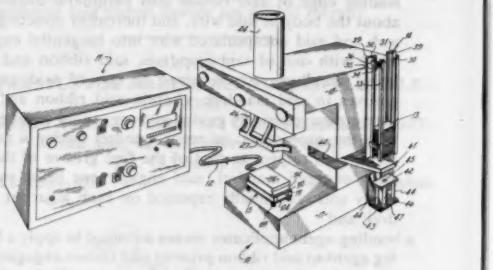
APPARATUS FOR APPLYING THERMOACTIVATABLE ADHESIVE COATED LABELS

Luke G. Lundskow; Robert J. Jaarsma, and Bobby J. Clay, all of Cincinnati, Ohio, assignors to Natmar, Inc., Cincinnati, Ohio

Filed Oct. 14, 1975, Ser. No. 622,034

Int. Cl.² B65C *5/04, 9/14, 9/36*

U.S. Cl. 156—571 **11 Claims**



1. In apparatus for applying to an article a label of the type having a thermoactivatable adhesive coated on one side thereof, the combination of:

a first platen for supporting said article;

a second platen;

means having at least one of said platens;

a label support disposed remote from said platens;

a transfer arm adapted for movement from a position adjacent said label support to a position adjacent to said first platen;

vacuum conduit means carried by said transfer arm for applying a vacuum to one area of a label;

heating means carried by said transfer arm for heating a second area of said label remote from said first to thermally activate an area of said adhesive;

means for shifting said transfer arm from a position in contact with a label on said support to bring said label into contact with an article on said first platen, whereby said label is tacked to said article;

means for shifting said transfer arm away from said first platen; and

means for forcing one of said platens against the other to apply heat and pressure to said label and article to effect a bond therebetween.

5. In apparatus for applying to an article a label of the type having a thermoactivatable adhesive coated on one side thereof, the combination of:

a lower platen for supporting said article;

an upper platen;

means heating at least one of said platens;

a magazine for supporting a stack of labels in superposed relationship remote from said platens;

a label support platform;

picker means for serially removing said labels from said magazine and depositing them on said platform;

a transfer arm adapted for movement from a position adjacent said label support platform to a position adjacent to said lower platen;

vacuum conduit means carried by said transfer arm for applying a vacuum to one area of a label;

heating means carried by said transfer arm for heating a second area of said label remote from said first to thermally activate an area of said adhesive;

means for shifting said transfer arm from a position in contact with a label on said platform to bring said label into contact with an article on said lower platen, whereby said label is tacked to said article;

means for shifting said transfer arm away from said lower platen; and

means for forcing one of said platens against the other to apply heat and pressure to said label and article to effect a bond therebetween.

4,012,278

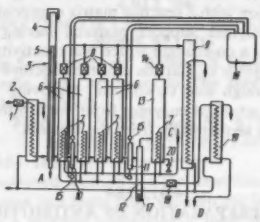
FEED WATER AND CONDENSATE SAMPLE ANALYZER FOR POWER PLANTS

Alexei Alexeevich Mostofin, ulitsa Karbysheva, 4, korpus 1, kv. 92, and Nina Sergeevna Sorokina, ulitsa Dmitrievskaya, 10, kv. 1, both of Leningrad, U.S.S.R.

Filed Sept. 19, 1975, Ser. No. 615,075

Int. Cl.² G01N *27/42*; B01D *1/02*

U.S. Cl. 159—30 3 Claims



1. A feed-water and liquid condensate sample analyzer for power plants, for a continuous analysis, comprising: a pressure column communicating with a concentrator for the sample, which produces at its outlet a sample with a minimum content of gaseous components of the sample being analyzed, and made up of a plurality of evaporators connected in series downstream of the phase flow of the sample; a throttle at the outlet of a steam-gaseous mixture of each of said evaporators; an electro-conductivity sensor at the outlet of said concentrator; said throttle of a first evaporator downstream of the sample flow having an aperture for the passage of the mixture, which aperture is smaller than apertures of said throttles of the other evaporators, and the size of said aperture is such that it ensures a level of a liquid phase so high as to ensure degassing of carbonic acid only; and a second electro-conductivity sensor between said first and said other evaporators, whose output is proportional to the content of ammonia in the liquid phase, with the result that the analyzer allows measurements of the content of both the salts and the ammonia in the process of the continuous analysis.

4,012,279

PROCESS OF PRODUCING PULP, FOR MANUFACTURE OF FIBERBOARD, IN A CLOSED BACKWATER SYSTEM

Stig Selander, and Karl Cederquist, both of Stockholm, Sweden, assignors to Stig Selander, Stockholm, Sweden

Filed Dec. 30, 1974, Ser. No. 537,470

Claims priority, application Sweden, Dec. 28, 1973, 7317565

Int. Cl.² D21C *3/24*; D21F *11/00*

U.S. Cl. 162—13 11 Claims

6. In a process for manufacturing fiberboard according to the wet method and with a closed backwater system which includes in sequence the steps of: defibrating lignocellulose fiber containing chips within a disintegrating apparatus in an atmosphere or saturated steam, suspending the defibrated material discharged from the defibrating step in backwater serving as propellant liquid to form a pulp suspension, forming wet sheets from the pulp suspension, mechanically separating off water from the wet sheets and recycling the water as backwater to form a new pulp suspension and drying the sheets by evaporation of water, the improvement comprising the steps of liberating steam from the defibrated material and preheating the chips with said steam to a temperature in the range of 90° to 100° C, then de-watering the steam-heated chips to a dry content of at least 50 percent, thereafter feeding the thus heated and de-watered chips to the defibrating step and simultaneously supplying backwater separated from the wet sheets to the defibration step for minimizing overheating of the fiber material.

4,012,280

DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL WITH AN ALKALINE LIQUOR IN THE PRESENCE OF A CYCLIC KETO COMPOUND

Harry Hutchinson Holton, Beloeil, Canada, assignor to Canadian Industries, Ltd., Montreal, Canada

Filed Aug. 30, 1976, Ser. No. 718,980

Claims priority, application United Kingdom, Sept. 5, 1975, 36636/75; Sept. 5, 1975, 36637/75; Sept. 5, 1975, 36638/75; Sept. 5, 1975, 36639/75

Int. Cl.² D21C *3/02*, *3/20*, *9/10*

U.S. Cl. 162—65 11 Claims

1. A process for the delignification of lignocellulosic material comprising the steps of

1. treating the lignocellulosic material in a closed reaction vessel with an alkaline pulping liquor containing from 0.001% to 10.0% by weight based on the lignocellulosic material, of a cyclic keto compound selected from the group consisting of naphthoquinone, anthraquinone, anthrone, phenanthrenequinone, the alkyl, alkoxy and amino derivatives of said quinones, 6,11-dioxo-1H-anthra-[1,2-c]pyrazole, anthraquinone-1,2-naphthacridone, 7,12-dioxo-7,12-dihydroanthra[1,2-b]pyrazine 1,2-benzanthraquinone and 10-methylene anthrone, the treatment taking place at a maximum temperature in the range of from 150° C. to 200° C. for a period of 0.5 to 480 minutes, and
2. displacing the pulping liquor from the lignocellulosic material with water or an aqueous liquor inert to the lignocellulosic material to obtain a delignified cellulosic material.

4,012,281

WET LAID LAMINATE AND METHOD OF MANUFACTURING THE SAME

Warren C. Mayer, Somerville, and Donald V. Skistimas, Milltown, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 4, 1975, Ser. No. 555,230

Int. Cl.² D21F *11/00*; B32B *7/14*

U.S. Cl. 162—127 14 Claims

1. An improved wet laid fibrous laminate comprising a first layer consisting of fibrous material having a length of from 1 millimeter to 3 millimeters and an adhesive binder distributed in a print pattern throughout the layer whereby the layer has excellent wet and dry abrasion resistance and a second layer consisting of less than 60 percent of wood pulp fibers and from 40 percent to 100 percent of synthetic textile fiber having a length of ⅛ inch to 1 inch, said second layer being substantially free of binder material and being adhered to the first layer through the frictional entanglement of the textile fiber with the first layer and by the adhesive binder to provide an easily handleable absorbent laminate, said laminate having a bulk density of from 4 to 8 cubic centimeters per gram.

13. A method of manufacturing a wet laid fibrous laminate comprising depositing a first aqueous slurry of wood pulp fibers and synthetic textile fibers on a permeable screen to form a first layer consisting of less than 60% wood pulp fibers and from 60–100% synthetic textile fibers, depositing a second aqueous slurry of shot fibers consisting of short fibers having a length of from one to three millimeters on top of the first fibrous layer, removing a portion of the water from said fibrous layers to form a laminate, removing the laminate from the wire screen, applying an adhesive binder to the fibrous layer containing the fibers having a length of from one to three millimeters in an intermittent print pattern wherein the first

layer remains substantially free of binder, drying the laminate with the adhesive binder thereon to remove the remaining water and cure the adhesive binder.

4,012,282

MULTIPLE LEAD SEAL ASSEMBLY FOR A LIQUID-METAL-COOLED FAST-BREEDER NUCLEAR REACTOR

Ernest Hutter, Wilmette, and John A. Pardini, Brookfield, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 17, 1976, Ser. No. 686,989

Int. Cl.² G21C *17/10*

U.S. Cl. 176—87 **3 Claims**

1. A reusable multiple lead seal assembly comprising:

a hollow seal shell having a circumferential channel in its inner surface and a port through a wall of the seal shell connecting the circumferential channel with the outer surface of the seal shell;

means for sealably attaching the seal assembly to an end of a test assembly, including a plurality of antirotation lugs projecting from the seal shell for engagement with antirotation notches in the end of the test assembly to prevent rotation of the lead seal assembly with respect to the test assembly;

a seal body disposed in the seal shell, the surface of the seal body having a plurality of flutes, a circumferential body channel contiguous to the circumferential channel in the seal shell and forming a conduit therewith, which channel intersects each flute, and a threaded end of the seal body having an outer diameter less than the outer diameter of the seal shell;

means for sealing the multiple lead seal assembly;

at least one instrument lead in each flute of the seal body; and

a jacking nut having threaded engagement with the threaded end of the seal body and movable against the end of the seal shell surrounding the seal body wherein when the jacking nut is screwed against the seal body the seal body will shear and release from the seal shell, breaking the seal without damage to the seal assembly and leads.

4,012,283

ENZYME SEPARATION

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England

Division of Ser. No. 469,221, May 13, 1974, abandoned, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned. This application Sept. 2, 1975, Ser. No. 609,618

Claims priority, application United Kingdom, Feb. 11, 1971, 3469/71

Int. Cl.² C07G *7/02*

U.S. Cl. 195—66 R **14 Claims**

1. A process for the separation of mixtures containing a plurality of enzymes at least one of which requires a coenzyme for its reactivity, which comprises contacting the enzyme mixture in solution with a reactive matrix comprising an insoluble organic polymer support material having chemically attached thereto a co-enzyme which has reactivity for one or more of the enzymes so that the enzymes become attached to the support through said co-enzyme, removing the support containing said attached enzymes from the solution and eluting the enzymes sequentially from the support.

4,012,284

PROCESS OF PREPARATION OF ANTIBIOTIC F.I. 1762 DERIVATIVES

Aurelio Di Marco; Graziana Canevazzi; Arpad Grein, all of Milan; Piergiuseppe Orezzi, Rivanazzano Pavia, and Marcello Gaetani, Milan, all of Italy, assignors to Societa' Farmaceutici Italia, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 322,847, Nov. 12, 1963, Pat. No. 3,872,085. This application Oct. 6, 1964, Ser. No. 404,550

Claims priority, application Italy, Nov. 16, 1962, 22651/62

Int. Cl.² C12D *9/14*

U.S. Cl. 195—80 R **3 Claims**

1. A process for the preparation of a new antibiotic F.I. 1762, which comprises cultivating the Streptomyces 1762 under aerobic conditions in a liquid nutrient medium containing a carbon source, a nitrogen source and mineral salts, at a temperature between 25° and 37° C, over a period of time from 3 to 7 days, and extracting the formed antibiotic from the fermentation broth at a pH between 8 and 9 by means of a water-immiscible solvent, isolating and purifying the antibiotic F.I. 1762.

4,012,285

ANALYSIS OF ISOENZYME PATTERNS

Gerhard Pfleiderer, Witten; Hermann Lang, Darmstadt; Norbert Hennrich, Darmstadt, and Hans Dieter Orth, Darmstadt, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Nov. 27, 1973, Ser. No. 419,283

Claims priority, application Germany, Dec. 1, 1972, 2258822

Int. Cl.² C12K *1/04*; G01N *31/14*

U.S. Cl. 195—103.5 R **12 Claims**

1. A process for the quantitative deter ination of at least one diagnostically relevant isoenzyme form of a human enzyme occuring in a plurality of genetically defined, immunologically differentiable multiple isoenzyme forms, which comprises:

a. quantitatively measuring the total enzyme activity of said multiple isoenzyme forms in a human body fluid, tissue extract or excretion sample;

b. admixing a portion of said sample with a one to tenfold theoretical excess, based on the amount of antisera to the human isoenzyme antigens required to precipitate at least 90% of said antigens, of a precipitating antibody against an isoenzyme group of a heterologous species corresponding to a diagnostically relevant isoenzyme form, which antibody is substantially free of immunological activity against other of said multiple isoenzyme forms, to

produce a substantially quantitative antigen-antibody immunoprecipitin complex consisting essentially of said diagnostically relevant human isoenzyme form and said antibody;

c. substantially quantitatively separating said immunoprecipitin complex from the resultant admixture so that at least 90% of the diagnostically relevant human isoenzyme form activity is removed therefrom; and

d. quantitatively measuring the total enzyme activity of the remaining multiple isoenzyme forms substantially free of the diagnostically relevant human isoenzyme form, whereby the diagnostically relevant human isoenzyme form can be quantitatively determined.

4,012,286
DETERMINATION OF CREATINE PHOSPHOKINASE IN BODY FLUIDS

James Allen Sanderson, and William S. Stavropoulos, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 9, 1976, Ser. No. 675,389
Int. Cl.² G01N *31/14, 33/00*
U.S. Cl. 195—103.5 R **6 Claims**

1. An improved method for the determination of creatine phosphokinase in a body fluid wherein the body fluid is incubated with a mixture containing a thiol activator, creatine phosphate, hexokinase, glucose-6-phosphate dehydrogenase, glucose, nicotinamide adenine dinucleotide, adenosine-5′-diphosphate and a tetrazolium salt dye until a measurable color develops and the color is measured wherein the improvement comprises:

a. incubating the body fluid with the thiol activator, creatine phosphate, hexokinase, glucose-6-phosphate dehydrogenase, glucose, nicotinamide adenine dinucleotide, and from 0.02 to 0.10% weight/volume of a nonionic ether-ester polyoxyethylated vegetable oil surfactant for a time sufficient to activate the creatine phosphokinase;

b. mixing the resulting incubate with adenosine-5′-diphosphate, the tetrazolium salt dye, and adenosine-5′-monophosphate;

c. incubating the resulting mixture for a time sufficient to develop measurable color; and

d. stopping the reaction after a pre-determined time with an acid.

4,012,287
METHOD AND REAGENT FOR THE QUANTITATIVE ANALYSIS OF TRIGLYCERIDES

Brigitte Carl, and Jaroslav Stourac, both of Berlin, Germany, assignors to Dr. Bruno Lange GmbH, Berlin, Germany

Filed Nov. 18, 1975, Ser. No. 632,984
Int. Cl.² G01N *33/16, 31/14*
U.S. Cl. 195—103.5 R **6 Claims**

4. In a method for the quantitative analysis of triglycerides by enzyme hydrolysis of said triglyceride in an alkaline aqueous medium to form glycerol, followed by quantitative analysis of the glycerol, the improvement which consists of adding a catalytic amount of a low molecular weight chlorinated hydrocarbon to the hydrolysis medium to accelerate the hydrolytic cleavage.

4,012,288
TISSUE CULTURE CLUSTER DISH

George F. Lyman, Weston, and Alan Lowry, Canton, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Oct. 6, 1975, Ser. No. 619,603
Int. Cl.² C12K *1/10*
U.S. Cl. 195—139 **17 Claims**

1. A tissue culture cluster dish assembly comprising:

a base having formed within it a plurality of wells for receiving materials,

said wells formed in said base having flat bottoms for distortion free viewing, by a user, of the material received, and undergoing change, in said wells,

said base having a front end and a back end;

a lid for covering said base and the wells therein,

said lid having a front end and back end,

said lid being removably locatable on said base,

said lid and said base being formed of a transparent material,

said base having a base rim running around said base,

said base rim having a lower edge which constitutes the lowest extremity of said base and which lies in a plane so that said base may be supported thereon when placed upon a planar surface,

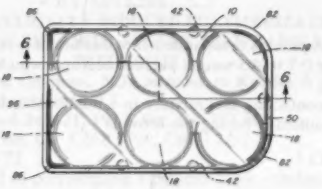
said flat bottoms of said wells lying in a plane elevated above and parallel to the plane in which said lower edge of said base rim lies so that said well bottoms cannot be scratched or soiled by making contact with any planar horizontal surface upon which said base may be placed,

said wells formed in said base each having vertical well walls,

said well walls each having upper edges which constitute the upper extremities of said base and which all lie in the same plane which is parallel to that in which said lower edge of said base rim lies,

said well walls having, at their bottoms, ribs extending downwardly below the plane in which said well bottoms lie,

said ribs running around the peripheries of said well bottoms thereby reducing the likelihood of the scratching



and soiling of the lower surfaces of said well bottoms when said tissue culture cluster dish is being handled.

17. A tissue culture cluster dish assembly comprising:

a base having formed within it a plurality of wells for receiving materials,

said wells formed in said base having flat bottoms for distortion free viewing, by a user, of the material received, and undergoing change, in said wells,

said base having a front end and a back end;

a lid for covering said base and the wells therein,

said lid having a front end and back end,

said lid being removably locatable on said base,

said lid and said base being formed of a transparent material,

said base having a base rim running around said base,

said base rim having a lower edge which constitutes the lowest extremity of said base and which lies in a plane so that said base may be supported thereon when placed upon a planar surface,

said flat bottoms of said wells lying in a plane elevated above and parallel to the plane in which said lower edge of said base rim lies so that said well bottoms cannot be scratched or soiled by making contact with any planar horizontal surface upon which said base may be placed,

said base having a plurality of upwardly extending protrusions having upper extremities all lying in a plane parallel to and above that in which the lower edge of said base rim lies,

said lid having a lower lip, lying in a plane and constituting the lower extremity of said lid, for engagement with and support from below by said upper extremities of said protrusions in said base,

said base having no side walls on at least its two sides so that viewing from the side through the lid is not hindered and inadvertent sealing cannot occur,

said lid, when in place on said base, having contact with said base only by its engagement with said protrusions in said base.

4,012,289

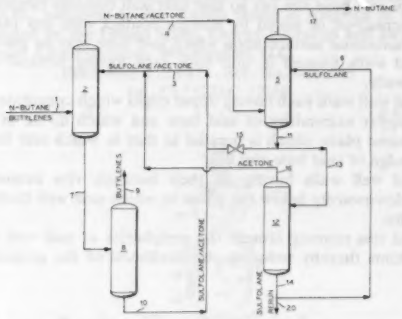
N-BUTANE/ACETONE SEPARATION USING SULFOLANE

Donald M. Haskell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 14, 1975, Ser. No. 621,886

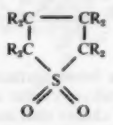
Int. Cl.² B01D *3/34, 3/40*

U.S. Cl. 203—51 **8 Claims**



1. A process to separate a first mixture of n-butane and from about 0.7 to 4.5 weight percent acetone which method comprises

a. contacting said mixture in a fluid contacting zone with a sulfolane having the formula



in which the radicals R which can be the same or different are individually selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms, cycloalkyl radicals having 3 to 6 carbon atoms, and phenyl, which radicals R in turn can be unsubstituted or substituted by alkyl, cycloalkyl and aryl radicals, said sulfolane having 4 to 12 carbon atoms per molecule, and

b. removing a first stream consisting essentially of n-butane and being essentially free of acetone and a second stream consisting essentially of sulfolane and acetone from said contacting zone.

4,012,290

ELECTROCHEMICAL DETECTION FOR LEAD ALKYLS

Donald C. Olson, Florissant, Mo., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 501,513, Aug. 29, 1974, Pat. No. 3,960,690. This application Jan. 23, 1976, Ser. No. 651,679

Int. Cl.² G01N *27/46*

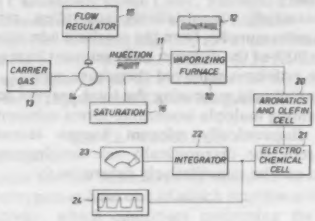
U.S. Cl. 204—1 T **4 Claims**

1. A method for measuring trace amounts of lead alkyls in gasolines comprising:

vaporizing a sample of the gasoline containing the trace amounts of lead alkyls;

passing the vaporized sample through a filter to separate the interfering aromatic and olefin components from the lead alkyls in the sample;

injecting the filtered sample into an electrochemical cell having an electrolyte; and



measuring the current produced by the electrochemical cell.

4,012,291

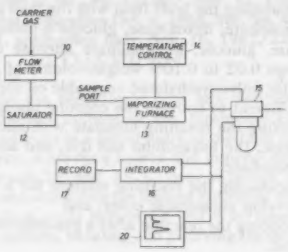
ELECTROCHEMICAL OLEFIN DETECTOR FOR GASEOUS STREAMS

Donald C. Olson, Florissant, Mo., and Michael P. Guillory, La Place, La., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 501,513, Aug. 29, 1974, Pat. No. 3,960,690. This application July 25, 1975, Ser. No. 599,267

Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T **2 Claims**



1. A method for measuring the quantity of olefins present in a hydrocarbon sample comprising:

vaporizing a sample of the hydrocarbon sample;

passing the vaporized sample to an electrochemical cell, said cell being filled with an electrolyte comprising a solution of $HgSO_4$ in H_2SO_4/H_2O/dioxane; and

measuring the current produced by the cell.

4,012,292

IMAGE RECORDING MEMBER

Takutoshi Fujiwara; Yasushi Takatori, both of Tokyo; Masahiro Haruta, Funabashi; Akemi Shimosawa, Tokyo, and Katsuhiko Nishide, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 23, 1975, Ser. No. 615,908

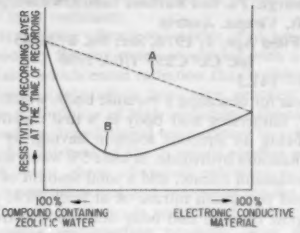
Claims priority, application Japan, Sept. 25, 1974, 49-110092

Int. Cl.² B41M *5/20;* **G01D** *15/34*

U.S. Cl. 204—2 **21 Claims**

1. An image recording member which comprises a support and a recording layer overlying the support, said recording layer being mainly composed of a binder, a component capable of forming an image when electric current is applied thereto, and a conductive component composed of a mixture of a compound containing zeolitic water and an electrically conductive material selected from the group consisting of finely divided metal powders, metal oxides selected from PbO,

ZnO, MgO, Ni_2O_3, CdO, Fe_2O_3, Ag_2O, HgO, Bi_2O_3, CeO, V_2O_5, Sb_2O_5, SnO_2, $BaTiO_3$, In_2O_3, Nb_2O_5, MnO_2 and La_2O_3, metal sulfates, metal halides, metal carbonates, metal carbide


RESISTIVITY OF RECORDING LAYER AT THE TIME OF RECORDING
A
B
100% COMPOUND CONTAINING ZEOLITIC WATER
100% ELECTRONIC CONDUCTIVE MATERIAL

and intermetallic compounds doped with a metal, wherein the amount of the electrically conductive material is between 5–70% by weight based on the compound containing zeolitic water.

4,012,293

METHOD FOR THE MANUFACTURE OF AC SUPERCONDUCTING ARTICLES

Robert Wagner Meyerhoff, Croton-on-Hudson, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 359,377, May 11, 1973, Pat. No. 3,906,412, which is a continuation of Ser. No. 160,926, July 8, 1971, abandoned, which is a continuation of Ser. No. 701,594, Jan. 30, 1968, abandoned. This application Aug. 7, 1975, Ser. No. 596,840

Int. Cl.² C25D *1/02, 3/66*

U.S. Cl. 204—9 **4 Claims**

1. A method of fabricating at least one superconducting RF cavity for continuously propagating or sustaining an alternating electromagnetic field at high power density with extremely low AC losses, in one piece comprising the steps of: depositing a layer of niobium upon a substrate by electrolyzing with the aid of an anode and said substrate as cathode, and an electrolytic melt consisting essentially of: (a) a base melt of at least one fluoride of potassium, rubidium, or cesium and at least one fluoride of other elements higher in the electromotive series than niobium, and (b) at least one fluoride of niobium, the proportions of said fluorides in said melt, the temperature of said melt and the electrolyzing current density being adjusted to produce a dense, structurally coherent deposit of said niobium upon said substrate, said substrate having a predetermined surface finish and shape conforming to the inner surface of the desired configuration for the RF cavity; depositing a layer of thermally conductive material having a predetermined thickness upon the outer surface of said niobium; removing the substrate to form a composite structure of niobium as the inner wall surface and said thermally conductive material as the other wall surface, the exposed inner wall surface of said niobium being a replica of the surface of the substrate; and vacuum outgassing said composite structure thereby forming the finished RF cavity.

4,012,294

GOLD SULFITE BATHS CONTAINING ORGANOPHOSPHOROUS COMPOUNDS

Salvatore Losi, Geneva, Switzerland; Pierre LaLanne, Gex, France; Rene Henzi, and Erwin Marka, both of Geneva, Switzerland, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Division of Ser. No. 386,798, Aug. 8, 1973, Pat. No. 3,904,493. This application Aug. 26, 1975, Ser. No. 607,742

Claims priority, application Switzerland, Aug. 10, 1972, 11975/72; Aug. 6, 1973, 11388/73

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² C25D *3/48, 3/62*

U.S. Cl. 204—43 G **5 Claims**

1. In an aqueous electroplating bath for the deposition of gold or a gold alloy from a sulfite complex, the improvement comprising including from 1 mg/l up to solubility limit of the bath of a soluble diphosphonic compound of the formula $(HO)_2PO—B—PO(OH)_2$ as a free acid, salified or esterified, wherein B is a linear, branched or cycle containing alkylene or aralkylene hydrocarbon chain of 1 to 30 carbon atoms, saturated or unsaturated, which may be interrupted with a heterofunction selected from the group consisting of -O- and —NH—, and which contains at least one carbonyl or halide substituent.

4,012,295

ELECTROLYTICALLY INDUCED POLYMERIZATION UTILIZING BISULFITE ADDUCT FREE RADICAL PRECURSOR

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed July 21, 1972, Ser. No. 273,903

Int. Cl.² C25B *3/00;* **C08G** *2/02*

U.S. Cl. 204—72 **3 Claims**

1. A method of polymerizing a polymerizable ethylenically unsaturated compound which comprises:

a. combining said compound with an aldehyde/bisulfite adduct;

b. effecting intimate contact between said polymerizable compound/adduct combination and the respective anode and cathode of an electrolytic circuit, said anode comprising metallic copper; and

c. effecting current flow in said circuit, thereby generating cupric ions at said anode and, upon the resulting introduction of said cupric ions into said combination, generating polymerization-initiating catalyst species in said combination.

4,012,296

ELECTRODE FOR ELECTROLYTIC PROCESSES

Donald E. Stephens, and Tilak V. Bommaraju, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,428

Int. Cl.² C25B *11/06, 11/10, 13/08, 1/46*

U.S. Cl. 204—98 **10 Claims**

8. In a method of electrolyzing aqueous solutions of an alkali metal chloride wherein chlorine is liberated at the anode, the improvement which comprises using as said anode, a composite structure comprising a valve metal substrate having adhered thereto and extending over at least a portion of the surface thereof, a coating consisting essentially of a mixed oxide of ruthenium and hafnium wherein the molar ratio of ruthenium:hafnium is from about 0.25 to about 4.0.

4,012,297

MERCURY RECOVERY AND RECYCLE PROCESS

Edward Nicholas Balko, Trenton, Mich.; William Francis Schmitt, Port Edwards, Wis., and Shyam Dattatreya Argade, Woodhaven, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 16, 1976, Ser. No. 649,817

Int. Cl.² C25B *1/36*

U.S. Cl. 204—99 5 Claims

1. A process for the purification of solids and liquid waste streams from a mercury amalgam chlorine plant employing an aqueous brine stream containing metallic mercury and soluble and insoluble mercury salts comprising

a. purifying said brine stream by adding sodium carbonate and sodium hydroxide to precipitate said mercury and mercury salts therefrom,

b. separating said mercury and mercury salts from the brine stream and reacting said mercury and mercury salts with sulfuric acid,

c. adjusting the pH of the slurry resulting from the reaction of step (b) from about 6.0 to 9.0 and oxidizing all of said metallic mercury and insoluble mercury salts present into soluble mercury salts, with an amount of oxidant sufficient thereto,

d. filtering the slurry and washing the solids whereupon the solids are removed,

e. removing residual oxidant, adjusting the pH of the solution from about 2.5 to about 6.0 and precipitating the mercury contained therein by adding an amount of sulfide source sufficient thereto,

f. filtering off the mercury sulfide and allowing the filtrate to be discharged,

g. dispersing said mercury sulfide in a brine solution, adjusting the pH to about 8 to 10, oxidizing the mercury forming soluble mercuric chloride,

h. combining the brine solution of step (g) with said brine stream of step (a).

4,012,298

PROCESS FOR THE ELECTROLYTIC RECOVERY OF GALLIUM AND/OR ALKALI METALS

István Somosi; Béla Tóth; József Boros, and János Vitéz, all of Ajka, Hungary, assignors to Ajkai Timfoldgyar es Aluminiumkoho, Ajka, Hungary

Filed Sept. 12, 1975, Ser. No. 612,803

Claims priority, application Hungary, May 21, 1975, AA 814

Int. Cl.² C25C *1/22*

U.S. Cl. 204—105 R 8 Claims

1. A process for the electrolytic recovery of gallium from an aluminate liquor of the production of crystalline alumina and containing sodium as well as gallium, the process comprising the steps of:

a. applying a mercury layer to a surface of a carrier electrode of a metal more electronegative than mercury until mercury coats said surface to form a mercury cathode;

b. electrolyzing said aluminate liquor at a temperature of less than 50° C with said mercury cathode to initially deposit sodium upon said mercury cathode and then depositing gallium thereon; and

c. solubilizing the gallium from said mercury cathode by treating the same with a gallium-solubilizing medium, thereby regenerating said mercury cathode for reuse of the same in step (a) for further acceptance of said recoverable metal.

4,012,299

METALLIC DESCALING SYSTEM

Donald R. Zaremski, Cheswick, Pa., and Albert Krepler, Vienna, Austria, assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa. and Ruthner Industrienanlagen Aktiengesellschaft, Vienna, Austria

Filed Apr. 1, 1976, Ser. No. 672,585

Int. Cl.² C25F *1/04, 1/06*

U.S. Cl. 204—141.5 5 Claims

1. A process for descaling a metallic body, which comprises the steps of: immersing said body in a first electrolyte, said electrolyte being an aqueous solution having, by weight, at least 60% potassium hydroxide, at least 5% water and no more than 30% potassium nitrate, and a total amount of potassium hydroxide and potassium nitrate of at least 80%; passing an electric current through said body and first electrolyte for a period of at least 3 seconds; removing said body from said first electrolyte after scale on said body has been conditioned for subsequent removal; subsequently immersing said body in a second electrolyte of an aqueous solution of at least one neutral salt from the group consisting of the chloride, sulfate, and nitrate of an alkali metal or ammonium; passing an electric current through said body and second electrolyte for a period of at least 4 seconds; and removing said body from said second electrolyte.

4,012,300

METHOD OF ALTERING THE FRIABILITY OF ABRASIVE PARTICLES

Robert John Caveney, 57 Victoria Ave., Sandringham, Johannesburg, Transvaal, South Africa

Filed Feb. 18, 1975, Ser. No. 550,577

Claims priority, application South Africa, Feb. 22, 1974, 74/1183

Int. Cl.² B01J *1/10*

U.S. Cl. 204—157.1 H 5 Claims

1. A method of decreasing the friability of diamond particles selected from SD, MD and RD diamond particles including the step of subjecting the particles to an irradiation capable of causing internal defects in the particles and consisting of an integrated flux of particles in the range 10^{17} to 10^{20} particles/cm² or gamma irradiation.

4,012,301

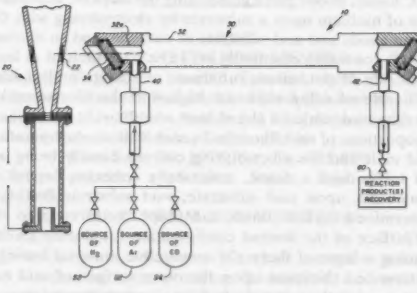
METHOD AND APPARATUS FOR THE INITIATION OF CHEMICAL REACTIONS

Joseph W. Rich, East Aurora, and John W. Raymonda, Williamsville, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed July 28, 1975, Ser. No. 599,512

Int. Cl.² B01J *1/10;* B01K *1/00*

U.S. Cl. 204—157.1 R 16 Claims



1. A method for initiating and accelerating vapor phase chemical reactions in a mixture of reactant species including the steps of:

supplying a plurality of reactant species to a reaction chamber;

continuously flowing the reactant species through the reaction chamber;

maintaining the reaction chamber at a pressure such that the vibration-rotation spectra of the reactant species are pressure-broadened to enhance the efficiency of absorption of laser radiation;

selectively exciting vibrational modes of at least one of the continuously flowing reactant species with a continuous wave laser which emits radiation that is absorbed by the vibrational mode of at least one reactant species to achieve a condition of high molecular vibrational excitations and low translational temperature to create a nonequilibrium mixture of the reactant species whereby the rate of vapor phase chemical reactions is accelerated while the translational and rotational modes of the mixture of reactant species is maintained relatively cold; and withdrawing the reaction products from the reaction chamber.

2. The method of claim 1 further including the step of supplying diluent at a pressure in the range of 20 to 100 atmospheres so that the vibration-rotation spectrum of the reactant species to be excited is pressure-broadened.

4,012,302

PHOTOCURABLE COMPOSITIONS CONTAINING S-ARYL ARYLCARBOTHIOIC ACID ESTERS AS PHOTOINITIATORS

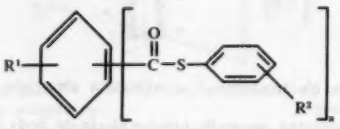
Richard H. S. Wang; James G. Pacifici, and Gordon C. Newland, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,328

Int. Cl.² C08L *1/00*; C08F *8/18*, *2/46*

U.S. Cl. 204—159.12 **7 Claims**

1. A composition comprising a photocurable ethylenically unsaturated compound and an S-aryl arylcarbothioic acid ester or a bis-S-aryl aryldicarbothioic acid ester photoinitiating effective amount of a compound having the formula:



wherein n is 1 or 2 and R^1 and R^2 are the same or different and are hydrogen, alkyl of up to about 12 carbon atoms, alkoxy of up to about 12 carbon atoms, halogen, phenyl, phenoxy or 2-benzoxazolyl.

4,012,303

TRIFLUOROSTYRENE SULFONIC ACID MEMBRANES

Vincent F. D'Agostino, Huntington Station; Joseph Y. Lee, Lake Grove, and Edward H. Cook, Jr., Lewiston, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls and RAI Research Corporation, Hauppauge, both of, N.Y.

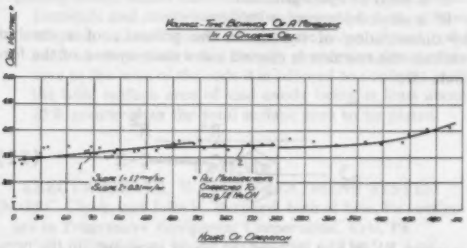
Filed Dec. 23, 1974, Ser. No. 535,636

Int. Cl.² C25B *13/08*; H01M *8/10*

U.S. Cl. 204—159.17 **12 Claims**

1. A membrane adapted for use in electrochemical cells comprising:

a. an inert polymeric base film; and



b. sulfonated α, β, β-trifluorostyrene irradiation grafted on said film.

4,012,304

METHOD OF RADIATION POLYMERIZATION AND COPOLYMERIZATION OF ISOBUTYLENE BY A CATIONIC MECHANISM

Miroslav Marek; Ludek Toman, and Jan Pecka, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademi ved, Prague, Czechoslovakia

Division of Ser. No. 275,157, July 26, 1972, Pat. No. 3,897,322. This application Apr. 3, 1975, Ser. No. 564,605

Claims priority, application Czechoslovakia, July 29, 1971, 5555/71

Int. Cl.² C08D *1/00*; C08F *1/16*

U.S. Cl. 204—159.24 **5 Claims**

1. A method for the polymerization and copolymerization of mono-olefinic monomers polymerizable by a cationic mechanism, which comprises subjecting to a source of light selected from the group consisting of ultraviolet light, visible light, and infrared light at a temperature between about 0° C. and about −140° C. a polymerizable mixture selected from the group consisting of isobutylene and mixtures of isobutylene with at least one diolefinic monomer selected from the group consisting of butadiene and isoprene in the presence of at least one halide catalyst selected from the group consisting of tetravalent vanadium, titanium and zirconium halides and in the presence of at least one activator for said halide catalyst selected from the group consisting of finely divided aluminum, carbon, copper, iron, and zinc, the molar ratio of said halide catalyst to said activator ranging from 10^3 to 10^{-3} part of halide catalyst to 1 part of activator.

4,012,305

PRODUCTION OF 1-METHYL-3-PHENYLINDANS

Martin Fischer, Ellerstadt; Hans-Juergen Quadbeck-Seeger, Ludwigshafen; Gerhard Kilpper, Mannheim; Hans-Georg Schecker, Ludwigshafen, and Waldemar Koehler, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 25, 1973, Ser. No. 354,222

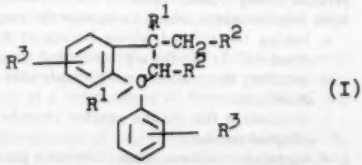
Claims priority, application Germany, May 6, 1972, 2222368

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07C *3/24*

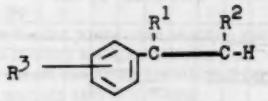
U.S. Cl. 204—162 R **13 Claims**

1. A process for the production of a 1-methyl-3-phenylindane of the formula (I):



(I)

in which
R^1 is alkyl or hydrogen;
R^2 is alkyl or hydrogen; and
R^3 is alkyl, hydrogen or halogen
by dimerization of styrene in the presence of a catalyst wherein the reaction is carried out with a styrene of the formula (II):



(II)

in which R^1, R^2 and R^3 have the above meanings, in the presence or absence of an oxidizing agent and in the presence of an organic compound capable of absorbing light of from 2000 to 8000 A and irradiated with said light.

4,012,306

PRODUCTION OF HIGHLY SOLUBLE, SOLID, RESINOUS, HIGHLY CHLORINATED ALPHA-OLEFINIC HYDROCARBON MATERIAL

Albert J. Henderson, Coraopolis, and John E. Krol, Moon Township, both of Pa., assignors to Neville Chemical Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 449,756, March 11, 1974, Pat. No. 3,896,183, which is a continuation-in-part of Ser. No. 267,444, June 29, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,908

Int. Cl.² B01J *1/10*; **C07C** *17/06*

U.S. Cl. 204—163 R **19 Claims**

1. A solid resinous chlorinated alpha-olefinic hydrocarbon material, which chlorinated alpha-olefinic hydrocarbon material contains above about 65% chlorine; has a ring and ball softening point of above about 90° C; and is completely soluble and gel-free initially and after 24 hours in xylene (50% solution −25° C.)

4,012,307

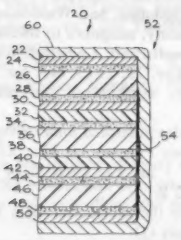
METHOD FOR CONDITIONING DRILLED HOLES IN MULTILAYER WIRING BOARDS

Eugene Phillips, Diamond Bar, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Dec. 5, 1975, Ser. No. 638,008

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 E **10 Claims**



1. A method for conditioning drilled holes in multilayer printed wiring boards prior to metal plating of conductive layer interconnects, which comprises the steps of:
a. baking the printed wiring boards at a temperature of about 49°–71° C. for a pre-selected length of time;
b. installing the printed wiring boards into a plasma reactor chamber;
c. evacuating the plasma reactor chamber to a first pre-selected pressure;
d. injecting into the reactor chamber a gas capable of forming an oxidizing plasma selected from the group consisting of oxygen and a mixture of oxygen and carbon tetrafluoride so that the partial pressure of the gas is at a second pre-selected pressure;
e. activating the radio frequency generator connected to the reactor chamber to create a gas plasma in the chamber;
f. maintaining the generator in an activated condition to maintain the plasma in the chamber for a pre-selected length of time;
g. deactivating the radio frequency generator and admitting air into the reactor chamber to equalize the internal pressure with that of the atmosphere;
h. purging the gases from the reactor chamber after air is admitted thereinto; and
i. opening the reactor chamber and removing the printed wiring boards therefrom.

4,012,308

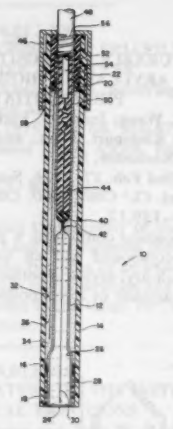
ION SENSITIVE COMBINATION ELECTRODE

Paul Jerrold-Jones, Claremont, and Irwin H. Krull, Santa Ana, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 7, 1975, Ser. No. 629,833

Int. Cl.² G01N *27/30, 27/36*

U.S. Cl. 204—195 F **11 Claims**



5. An electrochemical combination electrode assembly comprising:
an elongated, generally tubular electrode body having an ion-sensitive structure closing one end thereof;
an internal electrolyte reservoir within the electrode body adjacent the ion-sensitive structure;
a constriction within the electrode body intermediate the ends thereof and defining a capillary passage through the constriction having one side adjacent the internal electrolyte reservoir;
a first electrolyte within the internal electrolyte reservoir;
an indicating half cell disposed in the internal electrolyte reservoir and immersed in the first electrolyte therein and having a conductive portion passing out of the reservoir to provide electrical contact for the indicating half cell;
first elastomeric plug means sealing a side of the capillary passage remote from the internal electrolyte reservoir to seal the first electrolyte within the internal electrolyte reservoir for preventing formation and migration of air bubbles through the internal electrolyte reservoir to the ion-sensitive structure;
an elongated, generally tubular container coaxially surrounding the electrode body and together therewith defining an annular reference electrolyte reservoir therebetween;
a second electrolyte within the annular reservoir;

a reference half cell disposed in the annular reservoir and immersed in the second electrolyte therein and having a conductor portion thereof passing out of the reservoir to provide electrical contact for the reference half cell;

a liquid junction structure for providing communication between a sample to be measured and the annular reservoir; and

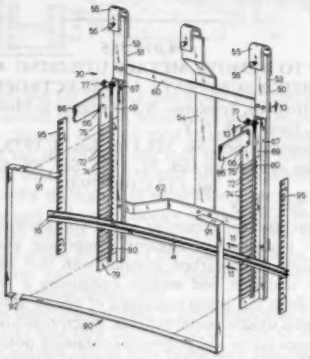
second elastomeric plug means situated in contact with the second electrolyte sealing the latter within the annular reservoir for preventing formation and migration of air bubbles through the annular reservoir to the liquid junction structure, whereby the electrode assembly can be used in any physical orientation, each respective elastomeric plug means providing an expansive seal for the respective electrolyte reservoirs thereby compensating for differing temperature coefficients of expansion of the electrode body, the tubular container, and the first and second electrolytes.

4,012,309

APPARATUS FOR MANUFACTURING PELLET SIZING SCREEN RODS

Dean R. Eslien, and James Salnick, both of Abrams, Wis., assignors to Ultra Plating Corporation, Green Bay, Wis.

Filed May 27, 1975, Ser. No. 581,092
Int. Cl.² C25D *17/08, 17/06*
U.S. Cl. 204—297 W **12 Claims**



1. Apparatus for electroplating a plurality of elongated metal rods comprising:

a source of direct current comprising a pair of output terminals of opposite polarity;

means for selectively reversing the polarity of said pair of output terminals to initially effect etching and then to effect plating;

a support frame for said rods including a pair of spaced apart elongated electrically conductive insulated members;

means for rigidly supporting said conductive members in spaced apart relationship;

first and second electrical connecting means for electrically connecting different points on said conductive members to said one output terminal;

releasably adjustable clamping means on each of said electrically conductive members for releasably supporting said rods at a non-horizontal angle to facilitate upward travel of gas bubbles formed on a surface of said rods during plating and for electrically connecting two spaced apart points on each rod to one of said output terminals;

an electrically conductive thiever on said support frame electrically connected to said conductive members and adapted to lie in substantially the same plane in which said rods are adapted to lie and adapted to surround said rods;

means for electrically connecting at least two spaced apart points on said thiever to said one output terminal; and

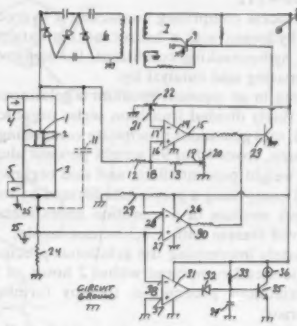
plating anode means connected to the other of said output terminals and comprising first and second anode sections adapted to be disposed on opposite sides of said rods, each anode section being directly proportional in surface area to the area of the rods it is adapted to confront, with the total surface area of said anode being at least about 25% greater than the total surface area to be plated.

4,012,310

ELECTROSTATIC WATER TREATMENT SYSTEM

David C. Clark, and John K. Barnard, both of Erie, Pa., assignors to Progressive Equipment Corporation, Erie, Pa.

Filed Sept. 11, 1975, Ser. No. 612,466
Int. Cl.² B03C *5/02*
U.S. Cl. 204—305 **12 Claims**



1. An electrostatic water treatment system having an insulated electrode and a ground electrode and adapted to receive water to be treated between the electrodes so the electrodes are in capacitance relation to each other through the water to be treated, said insulated electrode having an insulated coating for insulating it from the water, said ground electrode adapted to be in contact with the water, a power supply having a positive terminal connected to said insulated electrode and a negative terminal connected to said ground electrode for charging said insulated electrode to a high positive d.c. voltage relative to said ground electrode, and means for alternately turning the power supply on when the voltage drops to a lower limit and off when the voltage rises to an upper limit, said means further providing a small alternating voltage superimposed on said d.c. voltage.

4,012,311

SHORT RESIDENCE TIME LOW PRESSURE HYDROPYROLYSIS OF CARBONACEOUS MATERIALS

Marvin Greene, Somerset, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed Oct. 30, 1975, Ser. No. 627,448
Int. Cl.² C10G *1/06*
U.S. Cl. 208—8 **12 Claims**

1. A process for treating carbonaceous material with hydrogen, in the absence of added catalyst, to produce a high yield of carbonaceous tars, comprising, in serial combination,

a. adding liquid or crushed solid carbonaceous material into a first reaction zone of a reactor having at least two reaction zones; and a pressure of between atmospheric pressure and 450 psia;

b. adding hot hydrogen to the stream of carbonaceous material to effect a reaction with same to produce reaction products at a temperature of between 400° C and 2000° C.;

c. quenching the mixture of step (b) while insuring that the total residence time of heat-up, reaction and quenching

of said mixture varies from about 2 milliseconds to about 2 seconds;

d. removing at least a portion of the reaction products from said quenched mixture of step (c); and

e. introducing the residual carbonaceous material into a subsequent reaction zone and repeating steps (a) – (d) for said subsequent reaction zone.

4,012,312

HYDROCARBON HYDROCRACKING PROCESS

Jarold A. Meyer, Concord, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 438,504, Jan. 31, 1974, Pat. No. 3,978,001, which is a continuation-in-part of Ser. No. 250,399, May 4, 1972, abandoned. This application Dec. 22, 1975, Ser. No. 643,565

Int. Cl.² B01J *37/02, 27/24;* **C10G** *13/06*

U.S. Cl. 208—111 **10 Claims**

1. In a process comprising contacting a hydrocarbon feedstock and hydrogen with a hydrocracking catalyst under hydrocarbon hydrocracking conditions, the improvement comprising preparing said catalyst by:

A. forming in an aqueous medium a gelatinous precipitate and a finely divided transition series organic-metal compound, said gelatinous precipitate comprising, on a water-free basis, from 40 to 95 weight percent alumina and 60 to 05 weight percent silica, and said organic-metal compound comprising a precipitate formed by reaction in the aqueous medium of a transition series metal compound dissolved therein with 1,2,3-benzotriazole;

B. intimately intermixing the gelatinous precipitate and the organic-metal compound within 2 hours of formation of the gelatinous precipitate, thereby forming a catalyst precursor;

C. converting said precursor to a catalyst, the converting including at least a step of heating the precursor at a temperature in the range 500°–1800° F for a period in the range 1 to 48 hours, said catalyst being porous and having a surface area in the range from 50 to 700 m^2/g.

4,012,313

CATALYTIC REFORMING PROCESS AND CATALYST

Waldeen C. Buss, Richmond, and Harris E. Kluksdahl, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 355,606, April 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 301,696, Oct. 27, 1972, Pat. No. 3,852,190. This application Sept. 12, 1975, Ser. No. 613,011

Int. Cl.² C10G *35/08*

U.S. Cl. 208—139 **8 Claims**

1. A process for reforming a naphtha feedstock which comprises contacting said feedstock at reforming conditions with a catalyst comprising platinum, rhenium and chloride on an alumina support, said catalyst having been prepared by the steps of:

a. selecting an alumina support obtained by removing water from aluminum hydroxide produced as a by-product from a Ziegler higher-alcohol synthesis;

b. forming said alumina into an alumina catalyst support in particulate form;

c. calcining said support at a temperature between 1000° F and 1500° F until the surface area of the support is in the range from 140 m^2/g to 240 m^2/g;

d. impregnating the resulting calcined support with a platinum compound and a rhenium compound in the presence of enough chloride so that the impregnated composition, after drying and before calcining, contains more than 1.4 weight percent total chloride;

e. drying the resulting impregnated composition to provide a dried composition containing said more than 1.4 weight percent total chloride; and

f. calcining the resulting dried composition at a temperature between about 500° F and about 1200° F until the total chloride content of said composition is between about 0.8 and about 1.2 weight percent of the total weight of said catalyst.

4,012,314

TREATING COAL LIQUEFACTION PRODUCT OIL

William M. Goldberger, and Bobby P. Faulkner, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Sept. 5, 1975, Ser. No. 610,639

Int. Cl.² C10G *31/10*

U.S. Cl. 208—251 R **20 Claims**

1. A method of treating an oil derived by liquefaction of coal particles and containing unreacted solid matter to separate at least some of the unreacted solid matter therefrom and collect it in an aqueous medium, which comprises

controlling the specific gravity of the oil, by mixing it with another liquid, by controlling its temperature, or both, to provide an oleaginous fluid having a substantially lower specific gravity than the aqueous medium,

contacting the fluid with the aqueous medium,

moving the fluid in such a manner as to provide a substantial acceleration thereto in a direction to drive at least some of the solid matter away from the fluid and into the aqueous medium, and

separating the aqueous medium with the solid matter contained therein from the fluid.

4,012,315

TRAP TO REMOVE METALS UTILIZING A SULFUR MODIFIED SUBSTRATE AND ELECTROPHORESIS

Israel J. Heilweil, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 321,116, Jan. 4, 1973, abandoned. This application Oct. 31, 1975, Ser. No. 627,723

Int. Cl.² C10G *29/04*

U.S. Cl. 208—253 **5 Claims**

1. A method for removing metal contaminants from substantially hydrocarbon streams comprising contacting said substantially hydrocarbon streams with two successive bed sections; said first bed section containing a solid substrate selected from the group consisting of silicas, aluminosilicates, clays, metal oxides, metal sulfides, macroreticular resins, high surface area resins and polymers containing polar groups such as OH, N, SO_3^- and COO^-, upon which sulfur particles ranging in size up to an effective diameter of about 0.1 microns are deposited; and said second bed section containing particles comprising at least two of aluminum, cobalt, iron and carbon, whereby sulfur reaction products of said metal contaminants are produced in said first bed section and are plated out on the particles in said second bed section.

4,012,316

SOLIDS CLASSIFICATION DEVICE

Sven E. Osthund, Stockton, and Robert S. Bailey, Sr., Sacramento, both of Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 442,716, Feb. 14, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,250

Int. Cl.² B03B *5/28*

U.S. Cl. 209—10 **14 Claims**

1. A device for classifying a stream of solid fragments, comprising:

a. side-by-side first and second liquid-holding compartments separated by a partition wall which is arranged to form a weir between the compartments;

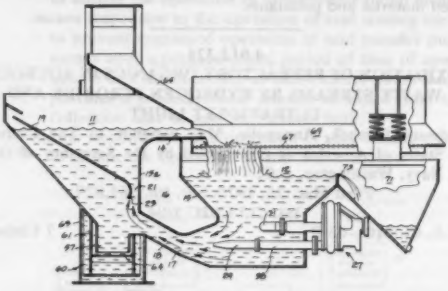
b. a downwardly inclined perforated plate mounted transversely across said first compartment to divide said first compartment into a lower region and a separation compartment above said lower region, the lower edge of said

plate being spaced from said partition wall to define therewith a flow throat area to permit liquid flow communication between said lower region and said separation compartment;

c. a flow tube extending through said partition to conduct the liquid from the lower region of said second compartment into said lower region of said first compartment, said flow tube having an enlarged mouth in said second compartment, an outlet in said first compartment and being generally quadrangular in cross-section;

d. a pump having an inlet which is connected into said second compartment to withdraw a fraction of the liquid therefrom;

e. a single eductor nozzle, whose outlet is generally rectangular in cross-section, fixedly connected to the outlet of said pump and arranged at the mouth of said flow tube in said second compartment for receiving the liquid from



said pump and for ejecting that liquid into said flow tube so as to induce the liquid which surrounds the eductor to also flow through said flow tube so as to establish a circulation of the liquid between said first and second compartments with the liquid in said first compartment flowing upwardly through said separation compartment and then over said weir, said eductor nozzle being constructed and located relative to said mouth of said flow tube so as to produce a flow pattern of the liquid which has a generally uniform upward velocity transversely across said separation compartment; and

f. means for directing a stream of solid fragments for classification into said flow throat area the flow of the liquid through said flow throat area being such that the heavier solids settle through said throat and the lighter solids pass with the liquid over said weir into said second compartment.

4,012,317

PROCESS FOR EXTRACTING UREA FROM A SOLUTION WITH ALKENYLAROMATIC POLYMERS WITH α-KETOALHYDIC GROUPS

Emile Kuntz, and Jean Pierre Quentin, both of Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 328,591, Feb. 1, 1973, Pat. No. 3,933,753. This application July 5, 1974, Ser. No. 486,098

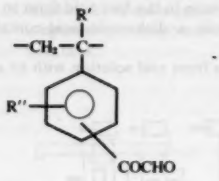
Claims priority, application France, Feb. 4, 1972, 72.03804

Int. Cl.² B01D *15/00*

U.S. Cl. 210—24 **12 Claims**

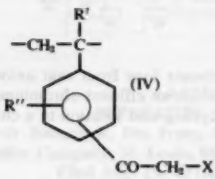
1. Process for extracting urea from a solution containing urea which comprises contacting the solution with an alkenylaromatic polymer consisting essentially of:

a. 50 to 100 % of recurring units of the formula:

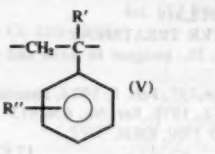


(VII)

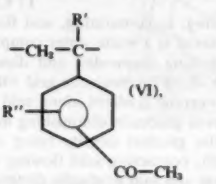
or recurring units of formula (VII) and recurring units selected from units of the formula:



(IV) and



(V) and



(VI),

at least 0.01% of the recurring units being recurring units of formula (VII); and

b. correspondingly 50–0% of recurring units of a non-aromatic ethylenically unsaturated monomer,

in which R' represents a hydrogen atom or a methyl radical, R'' represents a hydrogen atom or a methyl or ethyl radical and X represents a halogen atom;

at least one of the aromatic rings in the recurring units of formulae (VII), (IV), (V), and (VI) optionally being substituted by halogen.

4,012,318

METHOD FOR THE RECYCLE TREATMENT OF WASTE WATER FROM CHROMIUM PLATING

Toshio Hayashi, Inuyama, Japan, assignor to Kayabakoyo-Kabushiki-Kaisha, Tokyo, Japan

Continuation of Ser. No. 398,602, Sept. 19, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,729

Claims priority, application Japan, Sept. 22, 1972, 47-95535; Sept. 22, 1972, 47-95536; Sept. 22, 1972, 47-95537

Int. Cl.² C02B *1/20, 1/42, 1/56*

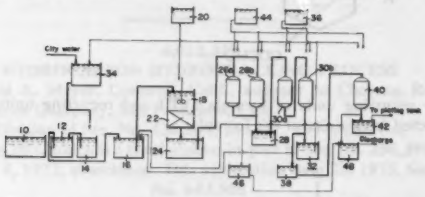
U.S. Cl. 210—28 **19 Claims**

1. A method of recycling chromium plating waste water which contains dissolved chromium and dissolved base metals which are precipitatable, by adjustment of pH to a range of approximately 7 to 9, comprising the steps of

adjusting the pH of the chromium plating waste water to a range of approximately 7 to 9 and thereby precipitating said dissolved metals from said waste water while the chromium remains in solution in said waste water;

contacting at least one portion of the resulting liquid with an acidic cation exchange resin in the free acid form so as to lower the pH and obtain a dichromic acid-containing solution;

adsorbing dichromate ions from said solution with an anion exchange resin;



desorbing adsorbed dichromate ions from said anion exchange resin so as to obtain an effluent chromium-containing solution; and recycling said solution to a chromium-plating bath.

4,012,319

WASTE WATER TREATMENT

Ernest R. Ramirez, Lemont, Ill., assignor to Swift and Company, Chicago, Ill.

Continuation of Ser. No. 438,737, Feb. 1, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,513

Int. Cl.² B03D *1/00;* **C02C** *5/12*

U.S. Cl. 210—44 **17 Claims**

1. A process for coagulating, agglomerating, and floating suspended and dissolved material in a waste water comprising flowing a waste water containing suspended and dissolved material through a flow path along an electrode grid within a tank, supplying an electric current gradient along said electrode grid, said electric current gradually diminishing in density along said flow path, the greatest density being at the influent end of the flow path, contacting said flowing waste water with said electrode grid and said gradually diminishing gradient of average current densities, forming microbubbles by electrolytically decomposing the waste water, and creating high water turbulence within the waste water only at the influent end, said high water turbulence being created and maintained within the grid iteself and thereabove by the microbubbles formed by said influent end greatest current density.

4,012,320

METHOD FOR IMPROVING THE QUALITY OF CONTAMINATED WASTE WATER

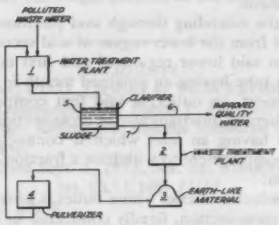
Jesse R. Conner, Pittsburgh; Edward A. Zawadzki, McMurray, and Ronald J. Polosky, Pittsburgh, all of Pa., assignors to Chemfix Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 453,844, March 22, 1974, abandoned. This application July 22, 1975, Ser. No. 598,069

Int. Cl.² C02B *1/20*

U.S. Cl. 210—45 **7 Claims**

1. A method for improving the quality of contaminated waste water by reducing the pollutants therein so that it can be reused or safely discharged, comprising pulverizing solid material obtained by mixing with liquid or semi-liquid waste material an aqueous solution of an alkali metal silicate and a silicate setting agent from the group consisting of Portland cement, lime, gypsum and calcium chloride, the amounts of said silicate and setting agent used being such as caused them to chemically react with each other and convert the mixture into a consolidated chemically and physically stable earth-like material substantially insoluble in water and with its pollutants entrapped in the solidified silicate, mixing an effective amount of the pulverized material with said waste water and maintaining them together long enough for the pulverized material to react with pollutants in the waste water to reduce the amount of said waste water pollutants and thereby improve the quality



of the water, and then separating from the water said pulverized material and pollutants.

4,012,321

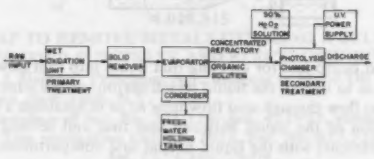
OXIDATION OF REFRACTORY ORGANICS IN AQUEOUS WASTE STREAMS BY HYDROGEN PEROXIDE AND ULTRAVIOLET LIGHT

Edward Koubek, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,829

Int. Cl.² C02C *5/04*

U.S. Cl. 210—63 R **7 Claims**



1. A method for lowering the chemical oxygen demand (COD) of an aqueous waste body, consisting essentially of

measuring the COD of said aqueous waste body;

adding an aqueous solution of hydrogen peroxide to said aqueous waste body, wherein the requisite number of grams of hydrogen peroxide equals no less than 2.1 times said measured chemical oxygen demand;

agitating said aqueous waste body and hydrogen peroxide;

flowing said aqueous waste body and hydrogen peroxide through a container; and

irradiating said aqueous waste body and said hydrogen peroxide as it flows through said container with ultraviolet light at a wavelength no greater than 2600 Angstroms.

4,012,322

MACERATOR-STERILIZER SEWAGE TREATMENT SYSTEM

Philip A. Saigh, Morton Grove, and Albert J. Glueckert, Skokie, both of Ill., assignors to General American Transportation Corporation, Chicago, Ill.

Filed May 5, 1975, Ser. No. 574,535

Int. Cl.² E03D *1/00*

U.S. Cl. 210—86 **24 Claims**

1. A sterilizer sewage treatment system useful in an overall toilet system to collect, treat and discharge toilet waste, which comprises:

a collection tank having an inlet, through which liquid sewage is fed to said collection tank, and an outlet;

a sterilization tank having an inlet and an outlet;

transfer pump means connected to said outlet of said collection tank;

power-operated valved transfer means connected to said transfer pump means and said inlet of said sterilization tank;

power-operated valved discharge means connected to said outlet of said sterilization tank;

heater means mounted on said sterilization tank; and

electrical means to control and operate said transfer pump means, said power-operated valved transfer means, said power-operated valved discharge means and said heater means, said electrical means including:

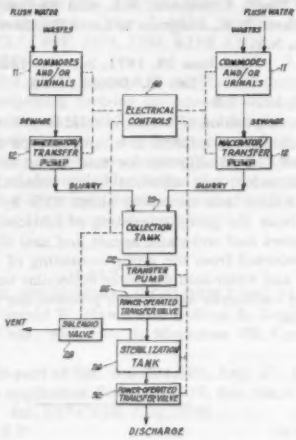
sensing means mounted on said collection tank and operative in response to a condition provided by a predetermined accumulation of liquid sewage received in said collection tank;

means responsive to the operation of said sensing means to operate said power-operated valved transfer means for an opening of its valve to communicate said transfer pump means with said sterilization tank for a predetermined period of time and then to close that valve;

means responsive to the operation of said sensing means to initiate the operation of said transfer pump means;

means responsive to the operation of said sensing means to prevent continued operation of said transfer pump means after a predetermined period of time of operation so that the operation of said transfer pump means provides a predetermined amount of waste from said collection tank to said sterilization tank;

means responsive to the operation of said sensing means to initiate the operation of said heater means;



temperature-sensing switch means operative in response to the temperature of the waste in said sterilization tank being raised to a predetermined temperature by said heater means, said switch means when operated being effective to cease the operation of said heater means;

timer means when initiated operates said power-operated valved discharge means to change its valve from an open position to a closed position or from a closed position to an open position;

first time-delay means initiated in response to the operation of said temperature-sensing switch means, when the waste in said sterilization tank reaches said predetermined temperature to operate said timer means, after a predetermined delay, to open said power-operated valved discharge means and, after a further delay, to close said power-operated valved discharge means; and

second time-delay means initiated in response to the operation of said temperature-sensing switch means, when the waste in said sterilization tank reaches said predetermined temperature, to operate after a predetermined delay, during which said valve of said power-operated valved discharge means has opened and then closed, said means preventing the continued operation of said transfer pump means so that said transfer pump means can operate again whenever said sensing means is operative in response to said condition in said collection tank.

4,012,323

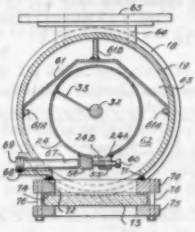
SEPARATOR APPARATUS

Momir Babunovic, Des Peres, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,724

Int. Cl.² B01D *25/08*

U.S. Cl. 210—232 **1 Claim**



1. In separator apparatus, for extracting insolubles and pulpy material from a fluid carrier medium, having a casing providing an inlet for the fluid carrier medium burdened with insolubles and pulpy material and an outlet for the insolubles and pulpy material substantially free of the fluid carrier medium; a perforated screen member extending between the inlet and outlet to divide the casing into an inner space inside said screen member and an outer space between said screen member and the interior of said casing; other outlet means in said casing for the fluid carrier medium substantially free of insolubles and pulpy material; elongated baffle means in said casing between said screen and said other outlet means for maintaining said screen member submerged in fluid carrier medium to the extent of the elongation of said baffle means; and a rotary conveying member in said screen member and extending from said inlet to said outlet to lift the insolubles and pulpy material to said outlet while the fluid carrier medium flows through said perforated screen member to said outer space; the improvement of said perforated screen member being split longitudinally to wrap about said rotary conveying member and form margins at the split; first means secured to and extending along one margin of said screen member and adjustably overlapping the other margin to close the space at the split and prevent leakage; second means carried by and extending along said other margin of said screen member; adjustment elements spaced along the length of and engaging said first and second means to change the spacing therebetween and vary the wrap of said split screen member about said rotary conveying member to compensate for wear of said rotary conveying member; and means in said casing forming an access opening to the interior for exposing said perforated screen member at the location of said adjustable means, said access opening means normally making said casing fluid tight.

4,012,324
CROSSLINKED, INTERPOLYMER FIXED-CHARGE MEMBRANES

Harry P. Gregor, Leonia, N.J., assignor to Harry P. Gregor, Leonia, N.J.

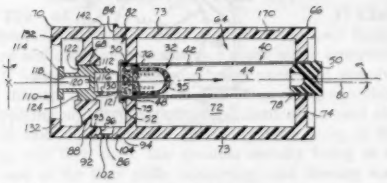
Division of Ser. No. 166,606, July 27, 1971, Pat. No. 3,808,305. This application Jan. 15, 1974, Ser. No. 433,930
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² B01D *31/00, 13/00*
U.S. Cl. 210—500 M **3 Claims**

1. A chemically cross-linked non-fouling polymeric membrane including polyelectrolytes having fixed-charge groups and characterized by a hydraulic permeability of 10^{-3} to 10^{-7} cm/sec. atm. measured in water or dilute salt solution under a pressure of 60 to 100 psi, a water content of from about 15 to about 75%, and characterized by a uniform porosity which produces a salt rejection of from 1.0 to 85% measured using 0.01 M potassium chloride solution at 25°C and 60 to 100 psi.

4,012,325
BIOLOGICAL FLUID DISPENSER AND SEPARATOR

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 539,557, Jan. 8, 1975, abandoned. This application May 27, 1975, Ser. No. 581,345
Int. Cl.² B01D *21/26*
U.S. Cl. 210—516 **29 Claims**



1. A blood serum separation device, comprising
opposed walls arranged about an axis to define a blood separation compartment having a blood inlet portion, a serum collecting portion and a blood cell-collecting portion, the serum-collecting portion being adjacent one end of the compartment, at least one of said walls being provided with a venting aperture having a maximum effective diameter of air flow which is less than that which will permit blood to flow therethrough under a pressure of about 1.245×10^{-5} dynes/cm²;
means for temporarily blocking flow of serum out of said one compartment end;
and a movable plug positioned transversely across said compartment, and in said serum-collecting portion adjacent to said blocking means and in contact with the walls of said compartment around the entire perimeter of said walls, for interrupting fluid flow of serum through the compartment, said plug comprising an inorganic thixotropic polymeric gel which is inert to the serum,
whereby flow of blood serum to said serum collecting portion occurs when a centrifugal force sufficient to initiate separation of the blood serum from the blood cells is generated against the plug away from said one end.

8. A blood serum separation device, comprising
opposed walls arranged about an axis to define a blood separation compartment said compartment having opposed ends, a serum-collecting portion adjacent one compartment end, and a cell-collecting portion
adajcent the other end;
closure means for closing said other end;
means for temporarily blocking flow of serum out of said one compartment, said means including a valve capable of permitting selective flow of serum;
a movable plug positioned transversely across said compartment, and in said serum-collecting portion adjacent to said blocking means and in contact with the walls of said compartment for interrupting fluid flow of serum through the compartment, said plug being provided with means permitting flow of blood serum to said serum collecting portion when a centrifugal force sufficient to initiate separation of the blood serum from the blood cells is generated against the plug towards said closure means; and
a chamber adjacent said serum-collecting portion, the interior walls of said chamber being generally cylindrically shaped, defining a chamber axis, a passageway being provided in said chamber walls which fluidly connects the chamber to the interior of said compartment,
said valve including at least one valve stem within said chamber closing off said passageway, said stem being mounted for rotation about said chamber axis.

4,012,326
ADDITIVES FOR CLOTHES DRYERS

Jerome Rudy, Livingston, N.J., and Anthony A. Rapisarda, Elmhurst, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed June 29, 1971, Ser. No. 158,090
Int. Cl.² D06M *13/46*
U.S. Cl. 252—8.8 **10 Claims**

1. A composition of matter in solid form for the application of an adjuvant to a fabric in a tumbler-type dryer, consisting essentially of an adjuvant for said fabric and a distributing agent therefor, said adjuvant being present in an effective concentration not exceeding about 95% by weight and selected from the group consisting of fabric softeners, optical brighteners and anti-static agents and said distributing agent being selected from the group consisting of ammonium carbonate and water-soluble, lower molecular weight, innocuous hydroxy carboxylic acids which promote the spreading of the adjuvant.

4,012,327
THICKENED ALCOHOL WELL TREATING COMPOSITIONS

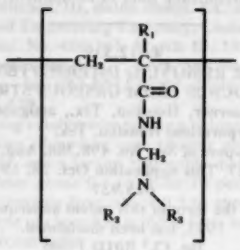
Jerry Emile Boothe, Coraopolis, and Fred David Martin, McMurray, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1975, Ser. No. 549,397
Int. Cl.² E21B *43/26*
U.S. Cl. 252—8.55 R **8 Claims**

5. A substantially anhydrous alcohol base fracturing fluid composition for use in fracturing subterranean formations comprising:
a. one or more substantially anhydrous alcohols of the formula:

$$C_nH_{2n+1}OH$$

where n is an integer of 1 to 5; said substantially anhydrous alcohols containing from 0 to about 5 percent by weight of water; and
b. at least 0.5 percent by weight of the alcohol of a thickening agent composition containing repeating units of the formula:



where R_1 is hydrogen or methyl, and R_2 and R_3 are each independently selected from alkyl radicals of one to five carbon atoms; and wherein the molecular weight of said composition is at least about 5,000.

4,012,328

ACID SOLUBLE PACKER AND WORKOVER FLUID

Melvel P. Hunter; Karl E. Gillenwater, and Henry J. Warren, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 345,926, March 29, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,881

Int. Cl.² C09K *3/00, 7/00;* **E21B** *43/22*

U.S. Cl. 252—855 R **3 Claims**

1. A method for preparing an acid soluble well completion packer fluid comprising forming an aqueous homogeneous solution of carboxymethyl cellulose, adding a weighting material to provide desired density, crosslinking the carboxymethyl cellulose by adding chromium compound selected from the group consisting of chromic chloride and chromic acetate and mixing therewith a chemically basic material at such a rate to avoid precipitating the chromium compound.

4,012,329

WATER-IN-OIL MICROEMULSION DRILLING FLUIDS

John B. Hayes; Gerald W. Haws, and William B. Gogarty, all of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 391,109, Aug. 27, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,280

Int. Cl.² C09K *7/02, 7/06*

U.S. Cl. 252—8.5 P **24 Claims**

1. An oil-external microemulsion drilling fluid which will conduct sufficient electrical current needed for electrical logging of a subterranean formation, the microemulsion comprised of about 15% to about 90% by volume water, about 5 to about 84% by volume liquid hydrocarbon, about 1% to about 30% by volume of a sodium petroleum sulfonate having an average equivalent weight of about 350 to about 525, and about 0.1% to about 15% by weight, based on the water, of a water-dispersible clay, said clay having been incorporated in the microemulsion by mixing it with the water phase and then mixing the clay-water mixture with the remaining ingredients of the microemulsion.

4,012,330

LITHIUM SALTS OF HYDROCARBON SUBSTITUTED AMIC ACID AS LOW ASH RUST INHIBITORS

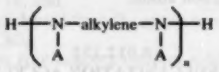
Philip W. Brewster, Wyoming, Canada, assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 10, 1975, Ser. No. 548,615

Int. Cl.² C10M *1/24*

U.S. Cl. 252—33.6 **9 Claims**

1. An oil composition comprising a major proportion of lubricating oil, and a minor rust inhibiting proportion, in the range of about 0.2 to 4.0 weight percent, of lithium salt of an amide of a hydrocarbon substituted succinic acid; said hydrocarbon substituent containing 12 to 20 carbon atoms and being selected from the group consisting of alkenyl and alkyl groups; said amide being the reaction product of said acid with a nitrogen material selected from the group consisting of ammonia, alkylene polyamines of the general formula:



wherein *n* is an integer less than about 10 and A is selected from the group consisting of hydrogen and a lower alkylene radical having less than about 8 carbon atoms, and said alkylene polyamines substituted with one or more hydroxy alkyl substituents on a nitrogen atom, in which the hydroxy alkyl group has less than about six carbon atoms.

8. A rust inhibiting oil concentrate comprising a mineral oil and about 10 to 50 wt. % of the lithium salt of the amide of dodecenyl succinic acid and tetraethylene pentamine.

4,012,331

SULPHUR COMPOUNDS

Gerald John Joseph Jayne; Herbert Frank Askew, both of Wokingham, and David Robert Woods, Bracknell, all of England, assignors to Edwin Cooper and Company Limited, Bracknell, England

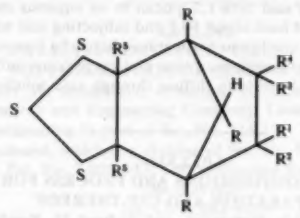
Filed July 21, 1975, Ser. No. 597,674

Claims priority, application United Kingdom, July 25, 1974, 32976/74

Int. Cl.² C10M *1/38*

U.S. Cl. 252—48.2 **17 Claims**

1. A process for the preparation of a sulphur compound suitable for use as a lubricant additive, said process comprising reacting a trithiolan compound having the general formula:



(A)

wherein:

a. each of R, R^2 and R^4 when taken singly is a hydrogen atom, an alkyl group containing from 1 to about 15 carbon atoms, an aryl group containing from 6 to about 15 carbon atoms or a cycloalkyl group containing from 4 to about 10 carbon atoms;

b. each R^1 and R^3 when taken singly is a hydrogen atom, an alkyl group containing from 1 to about 15 carbon atoms, an aryl group containing from 6 to about 15 carbon atoms, a cycloalkyl group containing from 4 to about 10 carbon atoms or an alkenyl group containing from 2 to about 10 carbon atoms or R^1 and R^3 taken together form the group —CHY.CY=CY— in which Y is a hydrogen atom or a methyl group or R^1 and R^2 taken together form an alkylidene group containing from 1 to about 6 carbon atoms; and

c. R^5 is a hydrogen atom or an alkyl group containing from 1 to about 15 carbon atoms

with a thiol compound in the presence of a base, said thiol compound being selected from the group consisting of thiophenol, alkyl substituted thiophenol, thiosalicylic acid, thioacetic acid, mercapto acetic acid, 1 thioglycerol, thioglycolic

acid, thiobenzoic acid, thiolactic acid, benzyl mercaptan, alkyl substituted benzylmercaptan, alkyl and alkoxyalkyl esters of thioglycolic acid and 3-mercaptopropionic acid, mercaptosuccinic acid, ethanolamine thioglycolate, furfuryl mercaptan, 2,5-dimercapto-1,3,4-thiadiazole, hydrocarbyl polyol esters of thioglycolic acid and 3-mercaptopropionic acid, and aliphatic hydrocarbyl thiols and dithiols in which the hydrocarbyl group contains 1–12 carbon atoms.

4,012,332

RUBBER VULCANIZATION ACCELERATOR COMPOSITION

Rudolf Adolf Behrens, Gladstone, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 438,098, Jan. 30, 1974, abandoned. This application Mar. 16, 1976, Ser. No. 667,326

Int. Cl.² C08K *5/40, 5/43, 5/44*

U.S. Cl. 252—182 **10 Claims**

1. A rubber vulcanization accelerator composition comprising (a) from about 0.1 to 1.5 parts of a benzothiazole-2-sulfenamide, (b) from about 0.02 to 1.5 parts of a thiuram sulfide or a metal dithiocarbamate, said metal being selected from the group consisting of zinc, cadmium, tellurium, bismuth, nickel, selenium and lead, and (c) from about 0.002 to 1.5 parts of copper 2-mercaptobenzothiazole per each 100 parts of said rubber; the weight ratio of said components (a), (b) and (c) being in the range from about 10:1:0.05 to 1:1:1, respectively.

4,012,333

METHOD OF MAKING GELS BASED ON BIOLOGICALLY PRODUCED POLYSACCHARIDES

Gordon A. Towle, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 23, 1975, Ser. No. 580,262

Int. Cl.² B01J *13/00*

U.S. Cl. 252—316 **3 Claims**

1. A process for preparing a firm continuous body of a gel of a beta-1,3-glucan polysaccharide which comprises preparing a solution of said beta-1,3-glucan in an aqueous medium having a pH of at least about 10.5 and subjecting said solution under quiescent conditions to an atmosphere of a gaseous acid anhydride under conditions of time and gas pressure sufficient to cause said anhydride to diffuse through said solution and effect gelling.

4,012,334

ANTIFOAM COMPOSITIONS AND PROCESS FOR THE PREPARATION AND USE THEREOF

William J. Raleigh, Watervliet, and Richard M. Ronda, Mechanicville, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

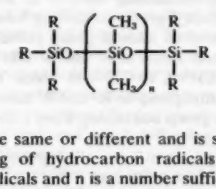
Filed Nov. 12, 1974, Ser. No. 523,280

Int. Cl.² B01D *19/04*

U.S. Cl. 252—321 **22 Claims**

1. An antifoam composition comprising:

a. a linear dimethylpolysiloxane fluid having the general formula



wherein R is the same or different and is selected from the group consisting of hydrocarbon radicals and substituted hydrocarbon radicals and n is a number sufficient to provide a viscosity of from about 100 to about 70,000 centistokes at 25° C in intimate admixture with

b. the reaction product of precipitated silica filler and hexamethyldisilazane prepared by contacting precipitated silica with hexamethyldisilazane in the absence of the dimethylpolysiloxane fluid of component (a).

4,012,335

PROCESS FOR REMOVING INTERMITTENT ORGANIC COMPOUNDS FROM GASEOUS STREAMS

Rudolph C. Woerner, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 498,388, Aug. 19, 1974, Pat. No. 3,962,127. This application Oct. 28, 1975, Ser. No. 625,937

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.² B01D *15/06*

U.S. Cl. 252—419 **8 Claims**

1. A process for regenerating a contact mass catalyst having coked thereon burnable carbonaceous material comprising:

a. contacting said coked catalyst with a first gaseous stream containing from about 15 to 20 percent by volume of oxygen, said gaseous stream being at a temperature in the range of 800° to 1500° F,

b. said first gaseous stream volatilizing a portion of said carbonaceous materials from said catalyst,

c. admixing a portion of said gaseous stream from step (b), said portion comprising the initial 5 to 8 volume percent of said gaseous stream from step (b), said initial portion comprising principally hydrocarbons, with a second gaseous stream containing at least about 10 volume percent oxygen,

d. converting said carbonaceous materials in said gaseous mixture of step (c) in a catalytic burner into CO_2 and water at a temperature in the range of 800° to 1500° F, and

e. recovering a gaseous stream from step (d) having substantially less of said carbonaceous materials than said mixture.

4,012,336

ALKALINE EARTH METAL ORGANOMETALLIC COMPOUNDS, THEIR PREPARATION BY METALLATION AND CATALYSTS COMPRISING SAME

Ivan Glen Hargis, Tallmadge, and Russell Anthony Livigni, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 524,336, Nov. 15, 1974, Pat. No. 3,966,638, which is a division of Ser. No. 69,476, Sept. 3, 1970. This application Apr. 29, 1976, Ser. No. 681,499

Int. Cl.² B01J *31/12*

U.S. Cl. 252—431 R **5 Claims**

1. A composition of matter useful as a homogeneous anionic polymerization catalyst comprising active catalyst material dissolved in an aprotic polar solvent selected from the group consisting of dialkoxyalkanes, dialkoxypolyalkanes, heterocyclic ethers, dialkyl ethers, peralkyl alkylene polyamines, peralkyl phosphoramides and mixtures thereof formed by reacting in said solvent metal selected from the group consisting of barium, strontium and calcium with arylalkane compound selected from the group consisting of triphenylmethane; 1,3,3-triphenyl propene; bis(2-methoxyphenyl) methane; 1,1,2-triphenyl ethane and 1,1-diphenyl alkanes and mixtures thereof in which the alkane group has 1 to 10 carbon atoms to convert at least part of said arylalkane compound into active catalyst material comprising an organometallic compound having an ionic carbon to metal bond of the formula:

R⁻ +M+ -R

wherein R is the organic anion of said organometallic compound formed by removal of a proton from said arylalkane compound and

M is the metal moiety of said organometallic compound and is selected from the group consisting of calcium, strontium and barium.

4,012,337

HIGH SURFACE AREA ALPHA ALUMINAS

Howard Lee Mitchell, III, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 450,767, March 13, 1974, abandoned. This application July 7, 1975, Ser. No. 593,844

Int. Cl.² B01J 27/04, 27/10

U.S. Cl. 252—439 9 Claims

1. A reforming catalyst comprising a halogenated composite of alpha alumina of surface area ranging about 100 m^2/g to about 600 m^2/g, and a Group VIII noble metal in concentration ranging from about 0.1 to about 10 percent, halogen in concentration ranging from about 0.3 to about 1.5 percent.

9. The catalyst of claim 1 in sulfided form and containing up to about 2 percent sulfur.

4,012,338

PROCESS FOR MANUFACTURING A CARRIER OF TITANIUM DIOXIDE

Donald Urwin, Cleveland, England, assignor to Tioxide Group Limited, Cleveland, England

Filed July 10, 1975, Ser. No. 594,872

Claims priority, application United Kingdom, Aug. 10, 1974, 35347/74

Int. Cl.² B01J 21/06

U.S. Cl. 252—461 11 Claims

1. A process for the manufacture of a carrier for an active entity which comprises selecting by sieving from raw anatase titanium dioxide the fraction having a particle size within the range of 150 microns to 350 microns and heating the selected fraction at a temperature of from 850° C. to 1300° C. for a time sufficient to produce a product having a hardness of at least 40, a bulk density of at least 0.8 grams per milliliter and a specific surface area of less than 5 square meters per gram.

4,012,339

METHOD FOR IMPROVING PHYSICAL PROPERTIES OF CATALYST MATERIALS THROUGH THE INCORPORATION OF FINES THEREIN AND CATALYST PREPARED BY THE METHOD

Robert Henry Ebel, Riverside, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 4, 1975, Ser. No. 628,715

Int. Cl.² B01J 21/04

U.S. Cl. 252—463 8 Claims

1. In a process of producing a particulate catalyst material comprising preparing a moldable aqueous paste of an inorganic oxide gel, molding said paste to provide a structured catalyst material, and stabilizing the structured material by drying and calcining, the improvement which comprises employing as said inorganic oxide gel one containing at least about 5 weight percent of calcined fines, based on the total weight of said inorganic oxide gel and said fines, said fines having a particle size less than about 100 mesh and at least 30 weight percent of said fines having a particle size less than about 325 mesh.

4,012,340

PROCESS FOR PREPARING CATALYSTS FOR HYDRODESULFURIZATION

Tatsuo Morimoto, Yokohama, Japan, assignor to Chiyoda Kako Kensetsu Kabushiki Kaisha, Yokohama, Japan

Continuation-in-part of Ser. No. 222,640, Feb. 1, 1972, Pat. No. 3,954,673. This application Apr. 10, 1975, Ser. No. 566,817

Claims priority, application Japan, Feb. 1, 1971, 46-3946

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.² B01J 21/04, 23/28

U.S. Cl. 252—465 7 Claims

1. A process for preparing a hydrodesulfurization catalyst which has fine pores sharply distributed in the range of 50 to 200A and comprising the steps of:

i. adding a molybdate to a water soluble aluminum complex represented by the formula

$$Al_n(OH)_mX_{3n-m}$$

wherein

$1 < n < 100$,

$3n > m$,

$n/(3n-m) \leq 16$, and

X is an anion selected from the group consisting of Cl, NO_3, I, Br and ClO_4,

whereby there is obtained a uniform solution composition;

ii. treating the uniform solution composition of (i) hydrothermally at a temperature of from about 120° to about 330° C;

iii. adding thereto a water soluble salt of nickel or cobalt;

iv. further adding thereto and mixing a member selected from the group consisting of diethylene glycol, glycerin, polyethylene glycol, carboxymethylcellulose, microcrystalline cellulose, hexamethylene tetramine, azodicarbonamide and dinitrosopentamethylene tetramine; and

v. treating the resultant mixture by drying, calcinating and grinding whereby said catalyst is obtained.

4,012,341

UNIQUE ALL SYNTHETIC DETERGENT SHAMPOO BAR

Philip Orshitzer, Staten Island, N.Y., and Antoni Macander, Ridgefield, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 24, 1975, Ser. No. 589,968

Int. Cl.² C11D 1/83, 1/70, 1/14

U.S. Cl. 252—548 3 Claims

1. A solid all synthetic detergent shampoo bar comprising from about 10–60% of a water soluble, solid, polyethoxylated dialkyl phenol wherein each of the alkyl groups contain more than 8 carbon atoms; from about 30–60% of a sodium or potassium higher alkyl sulfates wherein the alkyl group contains between 12 and 20 carbon atoms; and from about 10–40% of the monoethanolamide of stearic acid.

4,012,342

CATALYST-CONTAINING FIBERS AND THE POLYMERIZATION OF OLEFINS THEREON

Herbert W. Dougherty, Cranford, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 715,178, Feb. 14, 1958, abandoned, which is a division of Ser. No. 550,515, Dec. 1, 1955, Pat. No. 3,008,943. This application Feb. 18, 1963, Ser. No. 259,439

Int. Cl.² C08J 9/26

U.S. Cl. 260—2.5 B 6 Claims

1. A high molecular weight, normally solid polymer of a lower alpha olefin coated on organic fibers containing polar groups wherein said fibers are cellulose fibers or fibers of plastic polymers having recurring amide groups in their molecules.

4,012,343

CROSSLINKED OLEFIN POLYMER HAVING IMPROVED FLAME RETARDANCE

Charles F. Raley, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 53,332, July 8, 1970, abandoned, and Ser. No. 168,756, Aug. 3, 1971, abandoned. This application Sept. 9, 1974, Ser. No. 504,019

Int. Cl.² C08J 9/10; C08K 3/02, 5/02

U.S. Cl. 260—2.5 FP 14 Claims

1. In an olefin polymer composition containing a halogenated organic moiety which is active chlorinated organic compound, active brominated organic compound, passive brominated organic compound or hexachlorocyclopentadiene, dimerized hexachlorocyclopentadiene, hexachloroen-

domethylene tetrahydrophthalic acid or a derivative thereof and having the halogen concentration from about 5 to about 95 weight percent based on said moiety, the olefin polymer being selected from the group consisting of homopolymers and copolymers of aliphatic hydrocarbon monoolefins having no more than 12 carbon atoms, substituted α-monoolefins wherein the substituent is carboxylic acid, alkyl or haloalkyl ester of carboxylic acid wherein alkyl or haloalkyl has from 1 to 12 carbon atoms, acyl having from 1 to 12 carbon atoms, carboxylate having from 1 to 12 carbon atoms, alkoxyl having from 1 to 12 carbon atoms, and aryloxy having 6 to 12 carbon atoms, the improvement wherein the olefin polymer is cross-linked to at least its gel point and contains a flame retarding amount of elemental phosphorus having a specific gravity greater than 2.0.

4,012,344

TIRE TREAD COMPOSITIONS HAVING IMPROVED LOW TEMPERATURE PROPERTIES

Harvey L. Cohen, Matawan, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 475,988, June 3, 1974, Pat. No. 3,919,130. This application Oct. 6, 1975, Ser. No. 619,635

Int. Cl.² C08L *7/00, 23/20*

U.S. Cl. 260—4 R **6 Claims**

1. A tire tread composition exhibiting improved wet skid resistance and low temperature properties, the rubber polymer component comprising a blend of at least one general purpose rubber selected from the group consisting of natural rubber, polyiosprene, styrene butadiene, and polybutadiene and at least 20 wt. % of an elastomeric copolymer of isobutylene and cyclopentadiene, based on the weight of the copolymer plus said general purpose rubber, wherein said copolymer contains from at least 5% to less than 20 mol % of cyclopentadiene.

4,012,345

DES-(ALA¹, GLY²), MET¹¹-SRIF AND INTERMEDIATES

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 30, 1976, Ser. No. 654,147

Int. Cl.² C07C *103/52;* **A61K** *37/00;* **C08L** *89/00*

U.S. Cl. 260—8 **8 Claims**

6. A compound of the formula

R-L-Cys(R^1)-L-Lys(R^2)-L-Asn-L-Phe-L-Phe-A-L-Lys(R^2)-L-Thr(R^3)-L-Met-L-Thr(R^3)-L-Ser(R^4)-L-Cys(R^1)-X

wherein:

A is L-tryptophyl or D-tryptophyl

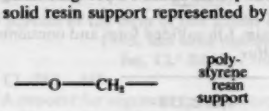
R is hydrogen, formyl, trifluoroacetyl, phthalyl, toluenesulfonyl, o-nitrophenylsulfenyl, benzyloxycarbonyl, p-methoxybenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, 2-bromobenzyloxycarbonyl, 2-chlorobenzyloxycarbonyl, 1-(p-biphenylyl)-1-methyl-ethoxy carbonyl, tert-butyloxycarbonyl, diisopropylmethoxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl, amyloxycarbonyl, α,α-dimethylbenzyloxycarbonyl, α,α-dimethyl-3,5-dimethoxybenzyloxycarbonyl, benzhydryloxycarbonyl, 9-fluoroenylmethoxycarbonyl, isobornyloxycarbonyl, adamantyloxycarbonyl;

R^1 is a protecting group for the sulfhydryl group of the two cysteinyl moieties independently selected from the group consisting of benzyl, 3,4-dimethylbenzyl, p-methoxybenzyl, p-nitrobenzyl, p-chlorobenzyl, trityl, benzhydryl, tetrahydropyranyl, acetamidomethyl, t-butylthio, ethylthio, ethylcarbamoyl, benzylthiomethyl or benzoyl;

R^2 is formyl, trifluoroacetyl, phthalyl, toluenesulfonyl, o-nitrophenylsulfenyl, benzyloxycarbonyl, p-methoxybenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, 2-bromobenzyloxycarbonyl, 2-chlorobenzyloxycarbonyl, 1(p-biphenylyl)-1-methyl-ethoxy carbonyl, tert-butyloxycarbonyl, diisopropylmethoxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl, amyloxycarbonyl, α,α-dimethylbenzyloxycarbonyl, α,α-dimethyl-3,5-dimethoxybenzyloxycarbonyl, benzhydryloxycarbonyl, 9-fluoroenylmethoxycarbonyl, isobornyloxycarbonyl, adamantyloxycarbonyl;

R^3 and R^4 are protecting groups for the hydroxyl group of the threonyl and seryl moieties, independently selected from the group consisting of benzoyl, tert-butyl, benzyl. The preferred protecting group for R^3 and R^4 is benzyl;

X is selected from the group consisting of OH, OCH_3 and an anchoring bond used in solid phase synthesis linked to a solid resin support represented by the formula



said protecting groups defined by R^1, R^2, R^3 and R^4 being capable of being split off chemically under conditions that do not cleave said peptide chain and at least one of R, R^1, R^2, R^3 and R^4 being a protecting group when X is OH.

4,012,346

ACRYLIC SYNTHETIC FIBERS HAVING AN ANIMAL HAIR-LIKE TOUCH AND ITS METHOD OF MANUFACTURE

Muneto Makiyama, Akashi; Taizo Yasumoto, Takasago; Shoji Kumazawa, Takasago; Shoichi Murata, Takasago, and Shiro Miya, Mino, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 556,217, March 7, 1975, abandoned. This application June 3, 1975, Ser. No. 583,513

Claims priority, application Japan, Mar. 9, 1974, 49-27411; Mar. 9, 1974, 49-27412

Int. Cl.² C08L *1/10*

U.S. Cl. 260—17 A **18 Claims**

1. Acrylic synthetic fibers having an animal hair-like touch, said fibers consisting essentially of

A. A fiber forming copolymer consisting essentially of 30 or more weight % of acrylonitrile, 70 and less weight % of vinyl chloride and/or vinylidene chloride and 0 to 10 weight % of other polymerizable vinyl monomers,

B. 0.1 to 8.0 parts of at least one metallic compound selected from the group consisting of SiO_2, TiO_2, ZrO_2, Al_2O_3, Sb_2O_5, MgO, CaO, ZnO, SnO, $Ti(OH)_4$, $ZrO(OH)_2$, $Al(OH)_3$, $Mg(OH)_2$, $Zn(OH)_2$, $AlPO_4$, $Ca_3(PO_4)$, $CaSO_4$, $BaSO_4$, ZnS, $2PbCO_3.Pb(OH)_2$ and 2PbO.Pb-$PHO_3.1/2H_2O$, to 100 parts of the said copolymer and

C. 1.0 to 8.0 parts of at least one cellulose ester to 100 parts of the said copolymer.

4,012,347

ANTIFOULING COMPOSITION

Melvin H. Gitlitz, Edison, N.J., and Aaron Freiman, Brooklyn, N.Y., assignors to M & T Chemicals Inc., Greenwich, Conn.

Filed Nov. 3, 1975, Ser. No. 628,360

Int. Cl.² C08K *5/58, 5/57*

U.S. Cl. 260—27 R **5 Claims**

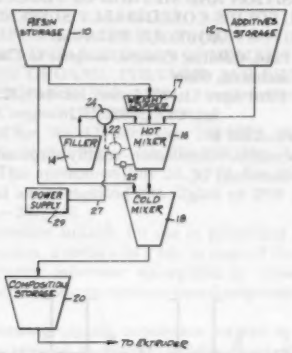
1. An antifouling coating composition comprising between 5 and 30% by weight of film-forming synthetic organic film-forming polymer and rosin, a pigment, between 10 and 40% by weight of an organic liquid diluent and between 1 and 25% by weight of a triorganotin compound of the formula $R_a^1R_{3-a}^2SnX$ or $(R_a^1R_{3-a}^2Sn)_2Y$, wherein R^1 is selected from the group consisting of alkyl radicals containing between 1 and 4 carbon atoms, R^2 is a cycloalkyl radical containing between 5 and 8 cyclic carbon atoms, X is selected from the group consisting of fluorine, chlorine, bromine, hydroxyl, alkoxy (—OR^3), thioalkoxy (—SR^3) and carboxyl radicals, (—$OOCR^3$), wherein R^3 is alkyl and contains between 1 and

12 carbon atoms, Y is oxygen or sulfur and a is the integer 1 or 2, and wherein the weight of rosin in said composition is between 0.25 and 3 times the weight of said film-forming polymer.

4,012,348
METHOD OF PREPARING A MIXTURE FOR MAKING EXTRUDED RESIN ARTICLES

Joseph John Chelland, Littleton, and Fred Everett Love, Denver, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 29, 1974, Ser. No. 528,111
Int. Cl.² C08L 91/00; C08J 3/20
U.S. Cl. 260—28.5 R **10 Claims**



1. In a method of making an extruded resin article, which method includes preparing a mixture including a first resin in particulate form with a non-resinous filler material in finer particulate form dispersed throughout said resin, air-conveying said mixture to the point at which the article is to be made from a remote location and making said article from said mixture by means of extrusion, the improvement comprising:

a. providing a second resin in particulate form, said second resin being such that

i. it has a melting point below that of said first-mentioned resin,

ii. when initially heated to its melting point, said second resin will adhere to adjacent particles of said first-mentioned resin and filler material but will not be immediately absorbed by said adjacent particles, and

iii. said second resin promotes fusion of said first resin during said extrusion;

b. substantially uniformly mixing said particles of second resin throughout said particles of first resin prior to combining said filler material with said first resin to provide a substantially homogeneous mixture of the two;

c. during said mixing step, heating said resins to the point at which said second resin initially melts such that the particles of second resin adhere to particles of the first resin;

d. after said second resin has reached said melting point and before it has a chance to be completely absorbed by said first resin, dispersing said filler material substantially throughout said first and second resins such that the particles of filler material adhere to said second resin particles; and

e. preventing said melted particles of second resin from being completely absorbed by said first resin particles or particles of filler material.

4,012,349
PROCESS FOR PREPARING NON-IONIC POLYURETHANE EMULSIONS

Kazuo Matsuda; Hidemasa Ohmura, and Hirakazu Aritaki, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Division of Ser. No. 527,247, Nov. 26, 1974, Pat. No. 3,951,897. This application Jan. 12, 1976, Ser. No. 648,361
Claims priority, application Japan, Nov. 27, 1973, 48-133215
Int. Cl.² C08G 18/32; C08J 3/06
U.S. Cl. 260—29.2 TN **10 Claims**

1. A method for preparing a polyurethane aqueous emulsion in which the polyurethane component is a polyurethane-urea-polyamine containing in the molecule a cross-linkable halohydrin structure, which comprises:

1. reacting (I) organic polyhydroxyl reactant mixture consisting essentially of 15 to 80 weight percent of a water-soluble polyoxyethylene glycol having a molecular weight of 200 to 10,000, and the balance a water-insoluble organic polyhydroxyl compound having a molecular weight of 200 to 10,000 and (II) an excess of organic polyisocyanate to produce an isocyanateterminated prepolymer, and

2. reacting said prepolymer with (III) polyalkylene polyamine having at least two groups selected from the group consisting of primary amino groups and secondary amino groups and also having a functional group of the formula

$$-CH(OH)CH_2X$$

where X is chloro or bromo, the total mole number of primary and secondary amino groups in the polyalkylene polyamine being greater than the total mole number of isocyanate groups in said prepolymer, the reaction being carried out until the presence of —NCO groups cannot be detected, whereby to form polyurethane-urea-polyamine,

3. reacting the polyurethane-urea-polyamine with a cyclic dicarboxylic acid anhydride, and

4. mixing the reaction product of step 4 with water to form a polyurethane emulsion.

4,012,350
LIQUID ADHESIVE FROM PHENOPLAST AND M-AMINOPHENOL

Oliver W. Burke, Jr., Fort Lauderdale, and Barbara P. Hunt, Pompano Beach, both of Fla., assignors to Oliver W. Burke, Jr., Fort Lauderdale, Fla.

Division of Ser. No. 219;173, Jan. 19, 1972, Pat. No. 3,922,468. This application Dec. 7, 1973, Ser. No. 422,777
Int. Cl.² C08L 61/14
U.S. Cl. 260—29.3 **15 Claims**

1. An improved adhesive composition for bonding substrates to one another, said adhesive composition being a liquid dispersion comprising, by weight, the combination of:

a. 5 to 250 parts of liquid dispersing medium,

b. 10 parts of phenoplast material selected from the members of the class consisting of group (I) that heat curable phenoplasts containing methylol groups; group (II), mixtures of (1) novolac phenoplasts substantially free from methylol groups with (2) at least sufficient methylene donor material to enable heat curing of the same; group (III) mixtures of (1) phenoplasts which complex with metal oxides with (2) at least sufficient material selected from the oxides and hydroxides of the metals calcium, magnesium and zinc, to complex with the phenoplast; and group (IV) heat curable combinations of the foregoing,

c. 0 to 150 parts of modifying polymer, and

d. 0 to 30 parts of material selected from the oxides and hydroxides of the metals calcium, magnesium, and zinc,

and said composition being improved in that it has mixed therein

e. 1 to 40 parts by weight of m-aminophenol.

4,012,351
STABILIZATION OF ACIDIC AQUEOUS COATING COMPOSITIONS CONTAINING AN ORGANIC COATING-FORMING MATERIAL

Wilbur S. Hall, Plymouth Meeting, and Harry M. Leister, Ambler, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 308,176, Nov. 20, 1972, Pat. No. 3,839,097, which is a continuation-in-part of Ser. No. 257,107, May 26, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,160

Int. Cl.² C08L *9/08*

U.S. Cl. 260—29.6 R **20 Claims**

1. In an acidic aqueous coating composition comprising (A) solid particles of an organic coating-forming material dispersed in the aqueous phase of said composition by an anionic or nonionic dispersing agent or a mixture thereof and (B) an oxidizing agent, wherein said composition is effective in forming on a metallic surface immersed therein, in the absence of the use of electricity, an organic coating which increases in weight or thickness the longer said surface is immersed in said composition, the improvement comprising including in said composition a surfactant having cationic properties in an amount of at least about 0.5 g/l of composition.

4,012,352
POLYVINYL ALCOHOL MICROGELS

Alden J. Deyrup, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 5, 1972, Ser. No. 259,552

Int. Cl.² C08F *27/04, 3/34*

U.S. Cl. 260—29.6 BM **5 Claims**

1. A solution of polyvinyl alcohol microgel comprising water, 0.05 to 10% by weight of polyvinyl alcohol and 0.2 to 2 parts by weight of tetravalent titanium ion being used per 100 parts by weight of polyvinyl alcohol, said microgel being derived from polyvinyl alcohol which has a Hoeppler viscosity of 4 to 150 centipoises measured as a 4% aqueous solution at 20° C. by the falling ball method, and in which at least 50 mole percent of the monomeric units are vinyl alcohol units, wherein the improvement comprises the polyvinyl alcohol microgel being a stable fluid of polyvinyl alcohol partially crosslinked with tetravalent titanium ions and water, said fluid having a Brookfield viscosity of 15 to 500 centipoises, said Brookfield viscosity being at least 15% greater than the viscosity of the aqueous polyvinyl alcohol solution from which the microgel is derived.

4,012,353
COPOLYMER HAVING QUATERNARY AMMONIUM, N-ALKOXYALKYL AMIDO, AND CARBOXY GROUPS, OPTIONALLY EPOXY RESIN, AND AQUEOUS DISPERSIONS

David Gilbert Chasin, and Joseph Feltzin, both of Wilmington, Del., assignors to ICI United States Inc., Wilmington, Del.

Filed Feb. 3, 1975, Ser. No. 546,344

Int. Cl.² C08F *20/06, 220/06*

U.S. Cl. 260—29.6 NR **7 Claims**

1. A cationic cross-linkable thermosettable copolymer stable in aqueous emulsions prepared from a monomer system which comprises:

a. 30–80 percent by weight of a non-functional alpha,beta-ethylenically unsaturated main monomer selected from the group consisting of styrene, alkyl styrenes, alkyl acrylates, methacrylates, vinyl ethers, vinyl acetates and substituted vinyl derivatives;

b. 0.1 to 15 percent by weight of an alpha,beta-ethylenically unsaturated monomer containing carboxyl groups;

c. up to 15 percent of acrylamide and N-alkyl substituted acrylamides;

d. 1–15 percent by weight of an N-alkoxyalkylamido group containing alpha,beta-ethylenically unsaturated monomer; and

e. up to 12 percent by weight of a cross-linkable epoxy resin modifier; and

f. 1–15 percent by weight of an alpha,beta-ethylenically unsaturated monomer having the following general formula:

$$CH_2=CR-Z-Y-NR'_3X$$

wherein

R is H or $-CH_3$;

Z is $-CO_2-$, $-CONH-$;

Y is an alkylene group;

R′ is a monovalent alkyl group the three of which may be the same or different; and

X is an anion;

said alkyl group in said above described compounds being hydrocarbon radicals having 1–4 carbon atoms.

4,012,354
COMPOSITION AND METHOD OF FLOCCULATING MINERAL SOLIDS COLLOIDALLY SUSPENDED IN AN AQUEOUS MEDIUM

Stewart N. Paul, Ontario, Canada, assignor to Chemed Corporation, Cincinnati, Ohio

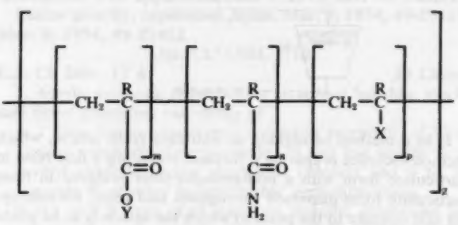
Filed Apr. 11, 1975, Ser. No. 567,325

Int. Cl.² C08L *33/26*

U.S. Cl. 260—29.6 E **2 Claims**

1. A flocculant composition readily dispersible in water consisting essentially of,

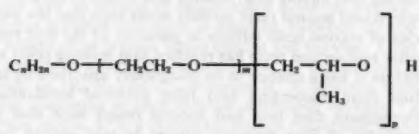
A. up to 90% by weight of a polymer of the formula



wherein Y represents hydrogen, ammonium, and alkali metal, R represents hydrogen or a methyl group, X represents halogen, a lower alkoxy or acetoxyl group, a cyanide group, a dialkylaminoalkyl group or a quaternized dialkylaminoalkyl group, m is 0 to 50, n is 50 to 100, p is 0 to 10, the sum of n plus m plus p is 100, Z is at least 15,000, and m, n, and p represent percentages of the groups present;

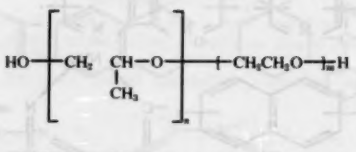
B. 0.1–5% by weight of a non-ionic surfactant having an HLB index below 10, selected from the group consisting of

1. Polyethoxylated-propoxylated fatty alcohols of the formula,



where n is 12 to 20, m is 1 to 50 and p is 1 to 50, and

2. Polypropylene oxide to which ethoxy groups are attached to form block copolymers, of the formula,



where *n* is 5 to 50 and *m* is 1 to 10

C. soda ash in an amount equivalent to free carboxy groups, if any, in the said polymer;

D. 1–5% by weight of chelant; and

E. up to 70% by weight of a filler.

4,012,355

COMPOSITION USEFUL IN PREVENTING ENVIRONMENTAL EROSION CONTAINING FILM FORMING ORGANIC POLYMER AND SILICONE

Kenneth H. Nimerick, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 427,609, Dec. 26, 1973, which is a continuation-in-part of Ser. No. 306,998, Nov. 16, 1972, abandoned. This application July 23, 1975, Ser. No. 598,524

Int. Cl.² C08L *25/10*

U.S. Cl. 260—29.7 NR **11 Claims**

1. A composition suitable for use in protecting from environmental erosion, a surface of a pile or mass of finely divided particulate matter otherwise susceptible to erosion, which composition comprises: an aqueous-based suspension containing

a. a film forming organic copolymer formed by the interpolymerization of, by weight, 36.5% styrene, 60% butadiene, 2% acrylic acid, and 1.5% maleic anhydride, and

b. a silicone which forms a hydrophobic coating on a substrate,

said composition containing the copolymer and silicone in amounts sufficient to cooperatively render such a surface resistant to environmental erosion when said composition is applied thereto in an effective quantity.

4,012,356

SUSPENSION-EMULSION INTERPOLYMER CONTAINING TRIS(2-ETHYLHEXYL) PHOSPHATE

Adam F. Kopacki, Westwood, N.J., and John H. Deatcher, Lake Peekskill, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 31, 1975, Ser. No. 563,438

Int. Cl.² C08K *5/10, 5/43, 5/51;* **C08L** *32/01*

U.S. Cl. 260—30.6 R **7 Claims**

1. In an acrylic rubber-containing suspensionemulsion interpolymer which contains a crosslinked acrylate component having a glass transition temperature of about 25° C. or less formed by emulsion polymerization, said component comprising from about 90 to about 99.8% of an aromatic or C_2–C_8 alkyl acrylate and from about 0.2 to about 10% by weight of a polyfunctional ethylenically unsaturated monomer and a polyvinyl chloride component formed by suspension polymerization, said polyvinyl chloride component comprising from about 40 to about 90% by weight of the crosslinked acrylate component, wherein the improvement comprises an effective amount of a tris(2-ethylhexyl)phosphate plasticizer.

4,012,357

RESINOUS COMPOSITIONS CONTAINING PLASTICIZERS COMPRISING HIGH MOLECULAR WEIGHT ESTERS OF C_{22+} ALPHA-OLEFIN DERIVED ACIDS

Harold C. Foulks, Jr., Newport, Ky.; Herbert G. Rodenberg, and Harold E. Mains, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 517,332, Oct. 23, 1974, Pat. No. 3,988,330. This application Aug. 6, 1975, Ser. No. 602,327

Int. Cl.² C08K *5/09, 5/10*

U.S. Cl. 260—31.2 R **7 Claims**

1. A thermoplastic polyvinylchloride homopolymer or copolymer resin containing 0.1 to 5 parts per 100 parts resin of an internal-external lubricant ester derived from an aliphatic hydroxylic compound containing from 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl groups and a mixed straight-chain aliphatic monocarboxylic acid obtained by the ozonization of C_{22+} α-olefins wherein at least 90% by weight of the olefins contain 22 or more carbon atoms, said mixed acid containing less than 30 % by weight acids having fewer than 21 carbon atoms, less than 20 % acids having greater than 35 carbon atoms and 55% by weight or more $C_{21\text{-}35}$ acids with the weight ratio of odd to even carbon content acids in the $C_{21\text{-}35}$ range being between 1.5:1 and 10.1.

4,012,358

PIGMENTING FIBER GRADE POLYESTER

Cesar A. Cardenas, West Milford; John D. Bien, Livingston, both of N.J., and Salvatore Carangelo, Staten Island, N.Y., assignors to Inmont Corporation, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,305

Int. Cl.² C08K *9/04*

U.S. Cl. 260—40 R **4 Claims**

1. A method of forming a concentrate mixture of pigment, polyethylene and fiber grade polyester comprising:

a. mixing 50 to 75 parts of pigment with 50 to 25 parts of dry, particulate polyethylene having a melt index of 20 to 300,

b. melting the polyethylene and continuing mixing for 10 to 20 minutes,

c. cooling the mixture of pigment and polyethylene to solidify the polyethylene,

d. converting the solidified mixture of pigment and polyethylene to particulate form,

e. mixing 1 part of the particulate mixture of pigment and polyethylene with 1 to 4 parts of particulate fiber grade polyester,

f. heating the mixture of pigment, polyethylene, and polyester to about 280° C., in a twin-screw extruder type of intensive mixer, and

extruding the mixture of pigment, polyethylene and polyester in the extruder at a temperature no higher than about 280° C. until the mixture has a filterability of less than 18.5.

4,012,359

ANTIBACTERIAL AGENTS FOR GRAM-NEGATIVE BACTERIA

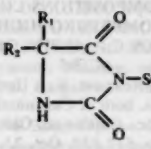
Saul Kaye, Evanston, Ill., and Robert L. Iverson, Northfield, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 313,404, Dec. 8, 1972, abandoned. This application June 13, 1974, Ser. No. 478,899

Int. Cl.² C08K *5/34*

U.S. Cl. 260—45.8 NE **9 Claims**

1. In combination: a resinous material selected from the group consisting of polyvinyl chloride and polypropylene containing from about 0.1 part to about 1.5 parts of an antibacterial agent per 100 parts by weight of said material to protect the material against growth thereon of microorganisms including Gram-negative bacteria, said agent comprising a compound of the formula:



in which both R_1 and R_2 are hydrogen, methyl, or ethyl and may be the same or different.

4,012,360

BIS-SALICYLOYL-DICARBOXYLIC ACID DIHYDRAZIDES AS STABILIZERS FOR POLYOLEFINES

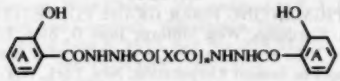
Kurt Schwarzenbach, Aesch; Helmut Mueller, Binningen, and Siegfried Rosenberger, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 421,467, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 170,379, Aug. 9, 1971, abandoned. This application Aug. 6, 1975, Ser. No. 602,499

Int. Cl.² C07C *103/26*

U.S. Cl. 260—45.9 NC **9 Claims**

1. A compound of the formula



wherein

X denotes a direct bond, alkylene of 1 to 8 carbon atoms, m-phenylene or p-phenylene;

n denotes 0 or 1; and

the rings A are each unsubstituted, or one or both rings A are substituted with an hydroxyl, a chlorine atom, an α-methylbenzyl, an alkanoyloxy of 2 to 18 carbon atoms or an alkanoylamino of 2 to 18 carbon atoms; or with one or two alkyl groups each of 1 to 8 carbon atoms, or one or two alkoxy groups each of 1 to 18 carbon atoms.

4,012,361

HEAT-STABLE POLYIMIDE RESINS FROM A BIS-IMIDE, A POLYAMINE AND AN ALAZINE

Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Feb. 22, 1972, Ser. No. 228,232

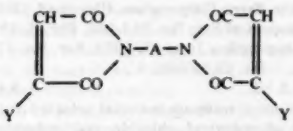
Claims priority, application France, Feb. 24, 1971, 71.06289

Int. Cl.² C08L *69/26, 73/10*

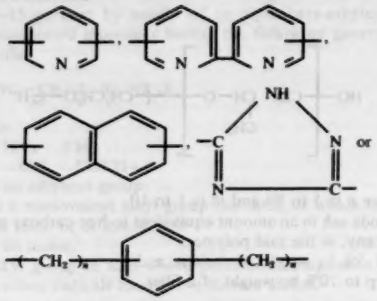
U.S. Cl. 260—47 CZ **17 Claims**

1. A heat-stable cured thermoset resin consisting essentially of a three-dimensional polyimide which is obtained by reacting at between about 50° and 350° C at least one reactant from each of the following three groups:

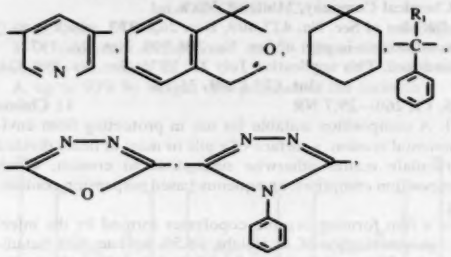
i. a bis-imide of the general formula

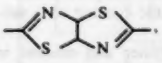


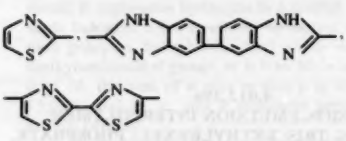
in which Y denotes H, CH_3 or Cl, and A represents a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of formulae:



wherein *n* represents an integer from 1 to 3 or a divalent radical with 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals bonded to one another by a simple valency bond or by —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, $-SO_2-$, $-NR_1-$, —N=N—, —CONH—, —COO—, $-P(O)R_1-$, —CONH—X—NHCO—,





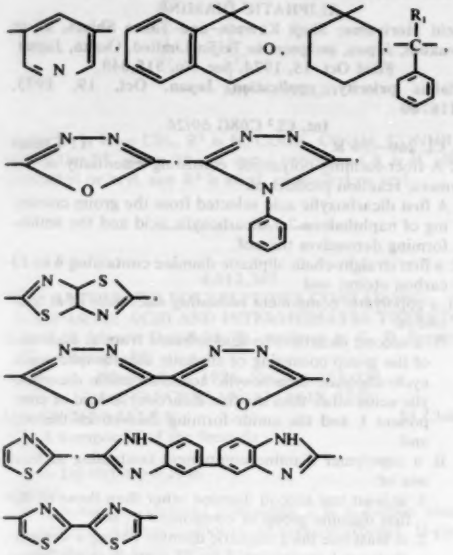


wherein R1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,

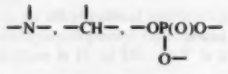
ii. a polyamine of the general formula:

$$R(NH_2)_x$$

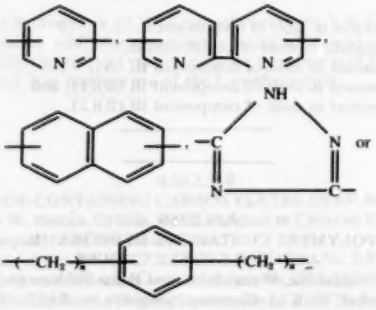
in which *x* represents an integer from 2 to 5 and R denotes an organic radical of valency x and selected from the group consisting of a 3 to 5 valent benzene, methyl benzene, naphthylene, pyridine or triazine radical, a 3 to 5 valent radical consisting of phenylene radicals bonded to one another by a simple valency bond or by —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, $-SO_2-$, $-NR_1-$, —N=N—, —CONH—, —COO—, $-P(O)R_1-$, —CONH—X—NHCO—,



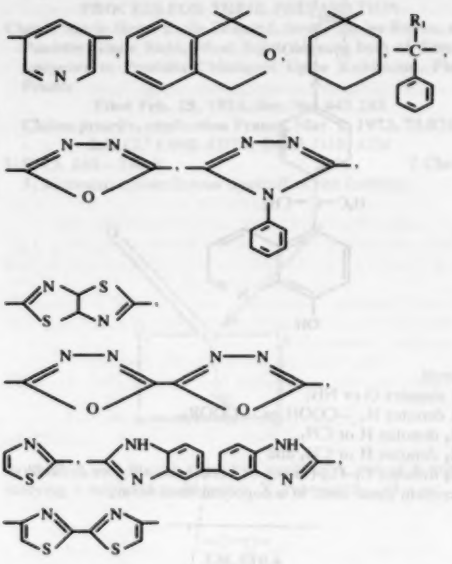
wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,



and —P(O)—, a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of the formulae:



wherein *n* represents an integer from 1 to 3 or a divalent radical with 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals bonded to one another by a simple valency bond or by —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, —NR_1—, —N=N—, —CONH—, —COO—, —$P(O)R_1$—, —CONH—X—NHCO—,



wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical, and

iii. an alazine of the general formula:

$$G-CH=N-N=CH-G$$

in which G represents a monovalent carbocyclic aromatic radical, in amounts such that if N_1 represents the number of mols of bisimide employed, N_2 represents the number of mols of polyamine employed and N_3 represents the number of mols of alazine employed, the ratio

$$\frac{N_1}{\frac{2N_2}{x}+N_3}$$

is from 1.5 to 10, *x* being defined as above.

4,012,362

POLYMERS CONTAINING 8-HYDROXYQUINOLINE GROUPS

Günther Reiff, Rua Poul Harris, Brazil; Dieter Margotte, Krefeld-Bockum, Germany; Karstel Idel, Krefeld, Germany; Hugo Vernaleken, Krefeld-Bockum, Germany, and Dieter Freitag, Krefeld-Traar, Germany, assignors to Bayer Aktiengesellschaft, Germany

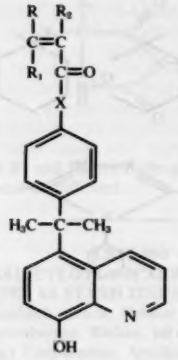
Continuation-in-part of Ser. No. 549,276, Feb. 12, 1975, abandoned. This application May 2, 1975, Ser. No. 573,837

Claims priority, application Germany, Feb. 15, 1974, 2407307; Feb. 15, 1974, 2407306

Int. Cl.² C08F *120/60*

U.S. Cl. 260—47 UA **3 Claims**

1. Polymers of number of average molecular weights of about 5,000 to 500,000, which comprise recurring polymerised units of a monomer of the formula I



wherein
X denotes O or NH;
R denotes H, —COOH or —$COOR_3$,
R_1 denotes H or CH_3,
R_2 denotes H or CH_3 and
R_3 denotes C_1–C_{18}-(linear or branched)-alkyl or cycloalkyl or contain these units in a copolymerised form.

4,012,363
COATING POWDERS ON THE BASIS OF THERMOPLASTIC POLYESTERS

Klaus Brüning, Bergisch-Gladbach; Karl-Günter Sturm, St. Augustin, and Siegfried Hahn, Siegburg-Kaldauen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Aug. 21, 1974, Ser. No. 499,250
Claims priority, application Germany, Sept. 15, 1973, 2346559
Int. Cl.² C08G 63/18
U.S. Cl. 260—75 R **13 Claims**

1. A coating powder consisting essentially of a partially crystalline polyester, which partially crystalline polyester has a glass transition temperature between +20 and +50° C., as determined at the attenuation maximum in accordance with Deutsche Industrie Norm 53,445, a reduced viscosity (n_{red}) of 0.7 to 1.0, measured in a 1 weight percent solution in a mixture of 60 parts by weight phenol and 40 parts by weight of 1,1,2,2-tetrachloroethane at 25° C. and a melting maximum, determined by a differential of thermoanalysis, of 170° to 190° C., said coating powder having a grain size of 60–300 microns and being in admixture with a leveling agent and a pigment, said partially crystalline polyester being derived from at least 60 mol percent terephthalic acid or its ester, in respect of its acid component, and at least 50 mol percent, in respect of its alcohol content, of 1,4-butanediol.

4,012,364
VINYL COPOLYMERS CROSS-LINKED WITH ALLYL DIGLYCOL CARBONATE

Elliott Farber, St. Louis Park, Minn., assignor to La Maur Inc., Minneapolis, Minn.

Filed May 19, 1975, Ser. No. 578,537
Int. Cl.² C08F 218/08, 218/14, 226/08
U.S. Cl. 260—77.5 D **16 Claims**

1. Film-forming polymeric material comprising the addition free-radical polymerization product formed by polymerizing a monomeric mixture consisting essentially of, by weight percent: 1 to 20% of 1,1 dimethyl-1,(2-hydroxypropyl) amine methacrylimide; 8 to 45% of N-vinyl pyrrolidone; and 35 to 89% of vinyl acetate.

4,012,365
FIBER-FORMING POLYAMIDES FROM NAPHTHALENE-2,7-DICARBOXYLIC ACID AND ALIPHATIC DIAMINE

Keiichi Moriyama; Shoji Kawase, and Takeo Shima, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 15, 1974, Ser. No. 515,048
Claims priority, application Japan, Oct. 19, 1973, 48-116760
Int. Cl.² C08G 69/26
U.S. Cl. 260—78 R **11 Claims**

1. A fiber-forming polyamide consisting essentially of the polymeric reaction product of:
I. A first dicarboxylic acid selected from the group consisting of naphthalene-2,7-dicarboxylic acid and the amide-forming derivatives thereof;
II. a first straight-chain aliphatic diamine containing 4 to 13 carbon atoms; and
III. a copolymer component consisting essentially of at least one of:
A. a second dicarboxylic acid selected from at least one of the group consisting of aliphatic dicarboxylic acids, cyclo-aliphatic dicarboxylic acids, aromatic dicarboxylic acids other than the first dicarboxylic acid of component I, and the amide-forming derivatives thereof; and
B. a copolymer diamine component containing at least one of:
1. at least one second diamine other than those of the first diamine group of component II, and
2. at least one third aliphatic diamine having a straight-chain and containing 4 to 13 carbon atoms, other than that used as component II, with the provisos that the proportion of the amino group in the total reaction components is equimolar to that of the carboxyl group or the corresponding amide-forming group thereof, and the amounts of components I, II and III satisfy the following molar percentages:

$$\frac{l}{l+x} \times 100 \text{ is from 50 to 100 mol\%,} \quad \text{(i)}$$

$$\frac{m}{m+y+z} \times 100 \text{ is from 50 to 100 mol\%, and} \quad \text{(ii)}$$

$$\frac{x}{l+x} \times 100 + \frac{y}{m+y+z} \times 100 + \frac{z}{m+y+z} \times 100 \quad \text{(iii)}$$

is from 15 to 50 mol%,

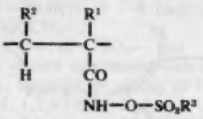
where
l = amount in mols of component I,
m = amount in mols of component II,
x = amount in mols of component III (A),
y = amount in mols of component III (B)(1), and
z = amount in mols of component III (B)(2).

4,012,366
POLYMERS CONTAINING HYDROXAMIC ACID-O-SULFONYL GROUPS

Herbert Naarmann, Wattenheim, and Heinz Pohlemann, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 17, 1975, Ser. No. 632,642
Claims priority, application Germany, Nov. 27, 1974, 2456007
Int. Cl.² C08G 75/00
U.S. Cl. 260—79.7 **5 Claims**

1. A polymer which contains structural units of the general formula



where R^1 is H or CH_3, R^2 is H, COOR, COOM, CONHR or NH-OSO_2-R^3, where M is a metal cation and R is H, alkyl, cycloalkyl or aryl, and R^3 is alkyl, cycloalkyl or aryl.

4,012,367
ANTI-ULCER POLYPEPTIDES CONTAINING L-ASPARTIC ACID AND INTERMEDIATES THERETO

Robert H. Mazur, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Feb. 5, 1976, Ser. No. 655,338
Int. Cl.² C07C *103/52*; **A61K** *37/00*
U.S. Cl. 260—112.5 R **11 Claims**

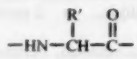
1. A compound of the formula

A-Trp-Met-Asp-Y-NHR I

wherein

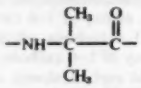
A is hydrogen, alkanoyl containing 2 to 6 carbon atoms, succinyl, t-butoxycarbonyl, benzyloxycarbonyl, D-pyroglutamyl or L-pyroglutamyl;

Y is a radical of the formula



wherein

R′ is an alkyl radical containing 1 to 6 carbon atoms or a methylcyclopentyl radical and the stereochemical configuration is D, or DL, or Y is a radical of the formula



R is hydrogen or an alkyl radical containing 1 to 6 carbon atoms; and pharmaceutically acceptable acid addition salts thereof; and the optically active amino acid Trp, Met and Asp residues are of the L-configuration.

4,012,368
SULFUR-CONTAINING CARBOXYLATES AS EP AGENTS

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 592,934, July 3, 1975, Pat. No. 3,970,568, which is a continuation-in-part of Ser. No. 500,235, Sept. 9, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,070
Int. Cl.² C07G *17/00*
U.S. Cl. 260—125 **8 Claims**

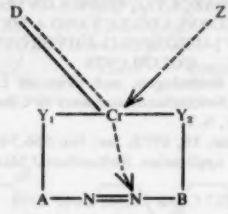
1. A composition comprising the reaction product of sulfur, sulfur monochloride or sulfur dichloride and an ester of an olefinic mono- or dicarboxylic acid which does not contain any allylic hydrogen atoms and mixtures of said reaction products.

4,012,369
MONOAZO CHROMIFEROUS COMPLEX DYESTUFFS DERIVED FROM NAPHTHYL-AZO-NAPHTHALENE, AND PROCESS FOR THEIR PREPARATION

Claude Marie Henri Emile Brouard, Scotteville les Rouen, and Paulette Gisele Ficht, Mont Saint Aignan, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 25, 1974, Ser. No. 445,185
Claims priority, application France, Mar. 2, 1973, 73.07457
Int. Cl.² C09B *45/16*; **D06P** *1/10, 3/24*
U.S. Cl. 260—146 R **7 Claims**

1. Monoazo chromiferous dyestuff of the formula:



(I)

in which A and B each represent naphthalyl, one of A and B carrying a sulphonic acid group, Y_1 represents —O— or

Y_2 represents —O— or

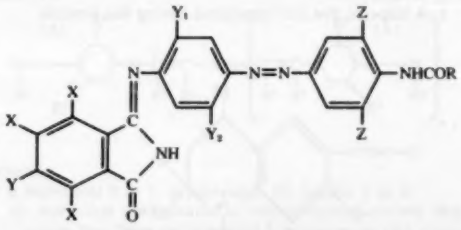
and Y_1 and Y_2 are each in a vicinal position with respect to the azo group, D is a β-diketonyl bidentate chelating agent and Z represents water, ammonia or pyridine.

4,012,370
MONO ARYL AZO-MONO-IMINOISOINDOLINONE DYESTUFFS

Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,242
Claims priority, application Switzerland, Jan. 9, 1973, 223/73
Int. Cl.² C09B *43/00*
U.S. Cl. 260—152 **2 Claims**

1. An iminoisoindolinone dyestuff of the formula



wherein X is chloro or bromo, Y is chloro, bromo or methoxy, Y_1 is hydrogen, chloro, alkyl containing 1–4 carbon atoms or alkoxy containing 1–4 carbon atoms, Y_2 is alkyl containing

1–4 carbon atoms, alkoxy containing 1–4 carbon atoms, alkanoylamino containing 1–4 carbon atoms, benzoylamino, benzoylamino substituted by chloro, alkyl containing 1–4 carbon atoms, or alkoxy containing 1–4 carbon atoms, Z is chloro or methyl, and R is alkyl containing 1–4 carbon atoms, phenyl, or phenyl substituted by chloro, alkyl containing 1–4 carbon atoms, or alkoxy containing 1–4 carbon atoms, or alkoxyco..taining 1–4 carbon atoms.

4,012,371

BENZINALDAZOLYL-, QUINOLONYL-, OR PHENMORPHOLONYLAZO-3-CYANO-4-METHYL-1,2-[1',2']-BENZ-[4',5']-IMIDAZOLO-6-HYDROXYPYRIDINE COLORANTS

Armand Rouéche, Bottmingen, and Francois L'Eplattenier, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

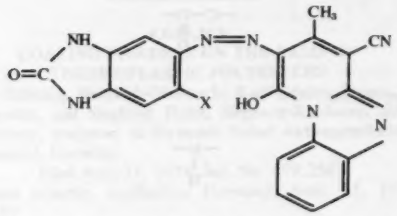
Filed Mar. 10, 1975, Ser. No. 556,744

Claims priority, application Switzerland, Mar. 12, 1974, 3417/74

Int. Cl.² C09B *29/36*; **D06P** *1/08*

U.S. Cl. 260—155 **4 Claims**

1. Azo colorant of the formula



wherein X denotes H methyl or methoxy chloro.

4,012,372

PHTHALIMIDYL-AZO-TETRAHYDRO-QUINOLINE COMPOUNDS

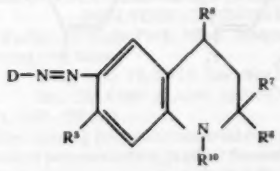
Max Allen Weaver, and Jean Carroll Fleischer, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 376,047, July 2, 1973, abandoned. This application Apr. 2, 1975, Ser. No. 564,527

Int. Cl.² C09B *29/36*

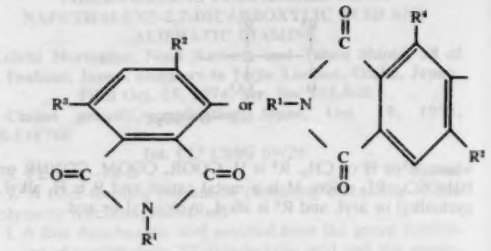
U.S. Cl. 260—155 **8 Claims**

1. A disperse dye azo compound having the formula



wherein group

D is a phthalimidyl goup having the formula



wherein R^1 is hydrogen, alkyl of 1–4 carbons, arylmethyl, cyclohexylmethyl, 2-cyanoethyl, 2-carbamoylethyl, aryl, cyclohexyl, or the group —Z—R^{17} in which Z is ethylene, propylene, or trimethylene and R^{17} is succinimido, glutarimido, phthalimido, hydroxy, alkanoyloxy of 1–4 carbons, 2-pyrrolidinone, or alkoxy of 1–4 carbons;

R^2 is hydrogen, alkyl of 1–4 carbons, chlorine, bromine, cyano, nitro, alkylsulfonyl of 1–4 carbons, arylsulfonyl, arylthio, arylalkylthio where the alkyl is of 1–4 carbons, cyclohexylthio, alkoxy of 1–4 carbons, aryloxy, 2-benzothiazolylthio, 2-thiazolylthio, 2-thiadiazolylthio, 2-oxadiazolylthio, 1,2,4-triazol-3-ylthio, or 2-pyrimidinylthio;

R^3 is hydrogen, chlorine, bromine or nitro;

R^4 is hydrogen, alkyl of 1–4 carbons, chlorine, bromine, cyano, nitro, alkylsulfonyl of 1–4 carbons, arylsulfonyl, arylthio, arylalkylthio where the alkyl is of 1–4 carbons, cyclohexylthio, alkoxy of 1–4 carbons, aryloxy, 2-benzothiazolylthio, 2-thiazolylthio, 2-thiadiazolylthio, 2-oxadiazolylthio, 1,2,4-triazol-3-ylthio, or 2-pyrimidinylthio;

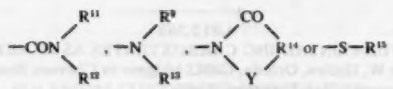
R^5 is hydrogen, methyl, chlorine, acetamido, benzamido, —$NHCOCH_2Cl$, —$NHCOCH_2OH$, —$NHCOOC_2H_5$, —$NHCOCH_2OC_6H_5$, or —$NHCOCH_2OOCCH_3$;

R^6 is alkyl of 1–4 carbons or, when R^7 and R^8 each is methyl, R^6 is methyl;

R^7 and R^8 each is hydrogen or methyl;

R^9 is formyl, alkanoyl of 1–6 carbons, alkanoyl of 1–6 carbons substituted with chlorine, bromine, phenyl or phenyl substituted with alkyl of 1–4 carbons, chlorine, bromine, or alkoxy of 1–4 carbons, cyano, alkoxy of 1–6 carbons, phenoxy, benzyloxy, alkythio of 1–6 carbons, alkylsulfonyl of 1–6 carbons, or alkanoyloxy of 1–6 carbons;

R^{10} is alkyl containing one to eight carbon atoms; cyclohexyl; cyclohexyl substituted with alkyl of 1–4 carbon atoms; or alkyl of 1–4 carbons substituted with hydroxy, lower alkoxy, aryl, aryloxy, cyclohexyl, cyano, alkanoyloxy of 1–4 carbons, alkoxycarbonyl of 1–4 carbons, alkoxycarbonyloxy of 1–4 carbons, aroyloxy, alkylcarbamoyloxy of 1–4 carbons, arylcarbamoyloxy, or a group having the formula



wherein

R^{11} individually is hydrogen, alkyl of 1–4 carbons, phenyl or phenyl substituted with alkyl of 1–4 carbons, chlorine, bromine or alkoxy of 1–4 carbons,

R^{12} individually is hydrogen or alkyl of 1–4 carbons,

R^{11} and R^{12} collectively are —$(CH_2)_5$— or —$CH_2CH_2OCH_2CH_2$—,

R^{13} is hydrogen, alkyl of 1–4 carbons, phenyl or phenyl substituted with alkyl of 1–4 carbons, chlorine, bromine or alkoxy of 1–4 carbons, or cyclohexyl,

R^{14} is ethylene, propylene, trimethylene, o-cyclohexylene, or o-arylene, or when Y is —CO—, R^{14} also can be —$NHCH_2$—, —N(alkyl of 1–4 carbons)CH_2—, —SCH_2—, or —CH_2OCH_2—,

Y is —CH—, —CO—, or —SO_2—, and

R^{15} is phenyl or phenyl substituted with alkyl of 1–4 carbons, chlorine, bromine, or alkoxy of 1–4 carbons, benzyl, cyclohexyl, 1,2,4-triazol-3-yl, or 2-benzothiazolyl,

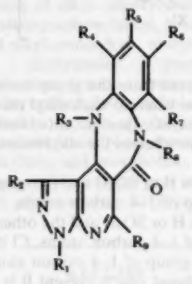
in which each aryl moiety of R^1, R^2, R^4, R^{10} and R^{15}, is phenyl or phenyl mono- or disbustituted with alkyl of 1–4 carbons, alkoxy of 1–4 carbons, chlorine or bromine.

4,012,373
PYRAZOLO[3′,4′-2,3]PYRIDO[4,5-e]b-BENZO-1,5-DIAZEPINONES

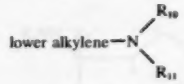
Theodor Denzel, Nurnberg; Hans Hoehn, Tegernheim, and Ernst Schulze, Regensburg, all of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 22, 1972, Ser. No. 291,503
Int. Cl.² C07D *471/14*
U.S. Cl. 260—239.3 P **15 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl or C_3 to C_6 cyclo-lower alkyl; R_2 is hydrogen, lower alkyl or phenyl; R_5 and R_6 each is hydrogen, alkyl up to 10 carbon atoms, phenyl-lower alkyl, C_3 to C_6 cyclo-lower alkyl or



wherein R_{10} and R_{11} each is hydrogen, lower alkyl or hydroxy-lower alkyl or the

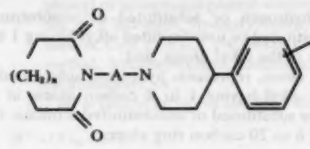
radical forms the heterocyclic pyrrolidino, piperidino, morpholino, thiamorpholino, (lower alkoxy)piperidino, (lower alkyl)piperidino, (lower alkyl)pyrrolidino, (lower alkoxy)pyrrolidino, (lower alkyl)morpholino, (lower alkoxy)morpholino, (lower alkyl) thiamorpholino or (lower alkoxy)-thiamorpholino R_4, R_5, R_6 and R_7 each is hydrogen, halogen, lower alkyl or lower alkoxy; and R_9 is hydrogen, lower alkyl or phenyl; and physiologically acceptable acid addition salts and quaternary lower alkyl halide, lower alkyl sulfate, phenyl-lower alkyl halide, phenyl-lower alkyl sulfate, lower alkyl sulfonate and phenylsulfonate salts thereof.

4,012,374
1-[[4-PHENYL-PIPERIDINYL (OR TETRAHYDROPYRIDINYL)]ALKYL]-2,6-PIPERIDINEDIONE AND ANALOGS

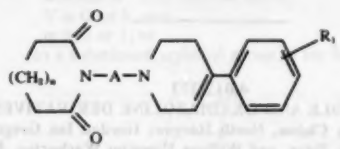
Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 29, 1975, Ser. No. 617,473
Int. Cl.² C07D *401/06*
U.S. Cl. 260—239.3 R **6 Claims**

1. A compound having the formula



or



or a pharmaceutically acceptable salt thereof, wherein *n* is 0, 1, or 2; A is an alkylene group having 1 to 8 carbon atoms; and R_1 is hydrogen, halogen, alkyl, alkoxy, alkylthio, trifluoromethyl, nitro, amino or cyano; wherein the alkyl, alkoxy, and alkylthio groups have 1 to 4 carbon atoms.

4,012,375
SILACYCLOPENTENYL-BIS-EPSILON-CAPROLACTAM

James R. Hahn, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 29, 1975, Ser. No. 644,379
Int. Cl.² C07D *223/12*
U.S. Cl. 260—239.3 R **1 Claim**

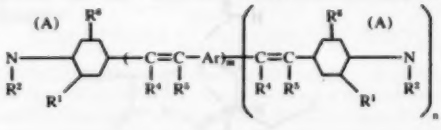
1. Silacyclopentenyl-bis-epsilon-caprolactam.

4,012,376
PHOTOSENSITIVE COLORANT MATERIALS

Hal E. Wright, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1975, Ser. No. 645,067
Int. Cl.² C07D *401/10*
U.S. Cl. 260—240 TC **4 Claims**

1. An electrically photosensitive colorant having the formula:



wherein

n represents 0 or 1; *m* represents the integer 1 or 2;

Ar represents a substituted or unsubstituted aromatic ring group, free from any saturated N-heterocyclic ring group fused thereto, having 6 to 20 ring atoms in the aromatic ring;

A represents a substituted or unsubstituted alkylene group having 2 to 5 carbon atoms in the alkylene chain;

each of R^1 and R^2, when taken together, represents a substituted or unsubstituted alkylene group having 2 to 5 carbon atoms in the alkylene chain;

each of R^1, R^4, R^5, and R^6, when taken alone, represents hydrogen, nitro, cyano, halogen, alkoxy having 1 to 8 carbon atoms, substituted or unsubstituted alkyl having 1 to 8 carbon atoms in the alkyl group, substituted or unsubstituted phenyl, carboxy ester having 1 to 4 carbon atoms, or an amide having the formula:

$-CONR_2^7$

wherein

R^7 represents hydrogen or substituted or unsubstituted phenyl or substituted or unsubstituted alkyl having 1 to 8 carbon atoms in the alkyl group; and

R^2, when taken alone, represents hydrogen, substituted or unsubstituted alkyl having 1 to 8 carbon atoms in the alkyl group, or substituted or unsubstituted aromatic ring group having 6 to 20 carbon ring atoms.

4,012,377

OXADIAZOLE AND OXADIAZOLINE DERIVATIVES

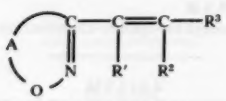
John Anthony Claisse, North Harrow; Gordon Ian Gregory, Chalfont St. Peter, and William Kingston Warburton, Pinner, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation-in-part of Ser. No. 473,064, May 24, 1974, abandoned, which is a continuation of Ser. No. 219,873, Jan. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 59,029, July 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 715,947, March 26, 1968, abandoned. This application Mar. 7, 1975, Ser. No. 556,324

Int. Cl.² C07D *271/06*

U.S. Cl. 260—240 D **9 Claims**

1. A compound of the formula



in which A is selected from the group consisting of residues of formula

and

R' and R^2 are each selected from the group consisting of a hydrogen atom, a halogen atom and a methyl or ethyl group; and R^3 is selected from the group consisting of azidophenyl, C_{1-5} alkylthio-phenyl, C_{1-5} alkylsulphinyl-phenyl, C_{1-5} alkylsulphonylphenyl, thiocynatphenyl and alkylthiothienyl.

4,012,378

REACTIVE DYESTUFFS

Allen Crabtree, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

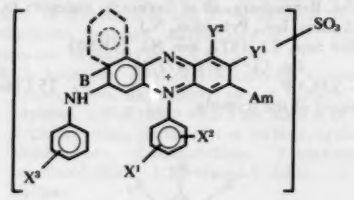
Division of Ser. No. 472,060, May 21, 1974, Pat. No. 3,951,974, which is a continuation-in-part of Ser. No. 323,359, Jan. 15, 1973, abandoned. This application Nov. 6, 1975, Ser. No. 629,607

Claims priority, application United Kingdom, Feb. 11, 1972, 6499/72; Aug. 28, 1973, 40522/73; Mar. 20, 1974, 12294/74

Int. Cl.² C07D *251/44, 251/50*

U.S. Cl. 260—240 B **2 Claims**

1. A reactive dyestuff of the formula



(1)

wherein AM is selected from the group consisting of anilino, di(lower alkyl)amino wherein each alkyl moiety has 1–4 carbon atoms, di(hydroxyethyl)amino, di(cyanoethyl) amino and N(alkyl)benzylamino wherein the alkyl moiety has 1–4 carbon atoms,

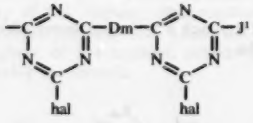
one of Y^1 and Y_2 is H or SO_3H and the other is H or an alkyl or alkoxy group of 1–4 carbon atoms,

one of X^1 or X^2 is H or SO_3H and the other is H, an alkyl or alkoxy group of 1–4 carbon atoms, Cl or CO_2H,

X^3 is H, an alkyl group of 1–4 carbon atoms or SO_3H,

when the dotted fused ring is present B is absent and when the dotted fused ring is absent B is H or an alkyl or alkoxy group of 1–4 carbon atoms,

one of the phenylene ring substituted by X^3 and the Am group when it is anilino contains a NHQ group wherein Q is a cellulose reactive group of the triazine series having the formula:



wherein hal is chlorine or bromine and

J^1 is chlorine, bromine, amino, NHR^5, NR^5R^6 or OR^5 wherein R^5 and R^6 are selected from alkyl having 1–4 carbon atoms; hydroxyalkyl having 1–4 carbon atoms; and sulphoalkyl having 1–4 carbon atoms; N-w-sulphomethylanilino, anilino or phenoxy, each having 0–2 substituents selected from SO_3H, CH_3, COOH, $SO_2CH_2CH_2OSO_3H$, OCH_3 and Cl; naphthylamino substituted by 1-3 SO_3H groups, or an aminophenazine group defined above by formula (1) with an NH group in place of NHQ and

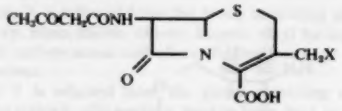
Dm is the N,N'-di-radical of the mono- or di- sulphonic acid of diaminostilbene, and the dyestuff as a whole contains at least 2 SO_3H groups.

4,012,379
7-ACETOACETAMIDOCEPHEM COMPOUNDS

Mitsuo Numata, Takatsuki; Masayoshi Yamaoka, Osaka; Yoshio Imashiro, Nishinomiya, and Isao Minamida, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,991
Claims priority, application Japan, Oct. 15, 1973, 48-115449
Int. Cl.² C07D 501/36
U.S. Cl. 260—243 C 18 Claims

1. A compound of the formula:



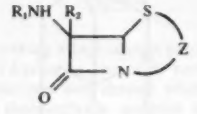
wherein X is a —SR group, R being a substituted or unsubstituted five-or-six-membered heterocyclic ring which contains at least one nitrogen atom that may be in the oxide form and which may contain in addition to said at least one nitrogen atom, one oxygen or sulfur atom, and the substituted ring being substituted by one or more substituents selected from the group consisting of alkyl, alkoxy, halogen, carboxyalkyl, carbamoylalkyl, alkoxycarbonylalkyl, N-alkylcarbamoylalkyl, alkylthioalkyl, N-alkylaminoalkyl, morpholinoalkyl, amino, sulfoalkylamino, acetylamino, propionylamino, N-alkylaminomethylcarbonylamino, mercapto, alkylthio, hydroxyalkylthio, alkylcarbonyloxyalkylthio, carboxyalkylthio, alkoxycarbonylalkylthio, N-alkylaminocarbonylalkylthio, morpholinocarbonylalkylthio, N-alkylaminoalkylthio, sulfoalkylthio, alkoxyalkylthio and morpholino, wherein said alkyl and alkoxyl groups are lower alkyl and lower alkoxyl groups respectively, or a pharmaceutically acceptable salt or ester thereof.

4,012,380
7-ACYLAMINO-3-ACYL-2(OR 3)CEPHEMS

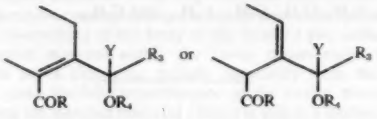
Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 10, 1974, Ser. No. 531,264
Int. Cl.² C07D 501/24, 501/60
U.S. Cl. 260—243 C 15 Claims

1. The compound of the formula



wherein Z is a group of the formula



wherein R is a group of the formula —OR_5 wherein

R_5 is hydrogen or a carboxylic acid protecting ester forming group;

R_4 taken together with Y forms a carbon-oxygen double bond; and

R_3 is C_1–C_6 alkyl, vinyl, allyl, ethynyl, benzyl, or phenyl; and

R_1 is an acyl group of the formula

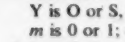
wherein R′ is

(a) C_1–C_6 alkyl, C_3–C_7 alkenyl, cyanomethyl, halomethyl, 4-amino-4-carboxybutyl, 4-protected amino-4-protected carboxybutyl; or

(b) benzyloxy, 4-nitrobenzyloxy or 4-methoxybenzyloxy; or

(c) the group —R″ wherein R″ is 1,4-cyclohexadienyl, phenyl or substituted phenyl wherein the substituents are 1–3 halogens, hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, carboxy, carboxymethyl, hydroxymethyl, aminomethyl or protected aminomethyl; or

(d) an arylalkyl group of the formula

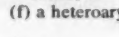


wherein R″ is as defined above,
Y is O or S, and
m is 0 or 1; or

(e) a substituted arylalkyl group of the formula

wherein R‴ is R″ as defined above, 2-thienyl or 3-thienyl, W is hydroxy or protected hydroxy, carboxy or protected carboxy, amino or protected amino; or

(f) a heteroarylmethyl group of the formula



wherein R⁗ is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl or 1-tetrazolyl; and

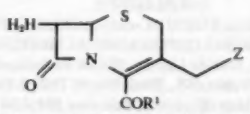
R_2 is hydrogen or methoxy; and when R_5 is hydrogen, the pharmaceutically acceptable non-toxic salts of the acids represented thereby.

4,012,381
PROCESS FOR PREPARING CEPHALOSPORINS AND INTERMEDIATES

Maurizio Foglio; Giovanni Franceschi; Paolo Masi, and Antonino Suarato, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

Filed June 12, 1975, Ser. No. 586,376
Claims priority, application Italy, June 12, 1974, 23887/74
Int. Cl.² C07D 501/18, 501/20
U.S. Cl. 260—243 C 2 Claims

1. A process for preparing derivatives of 7-amino-cephalosporanic acid and 7-aminodesacetoxycephalosporanic acid of structure



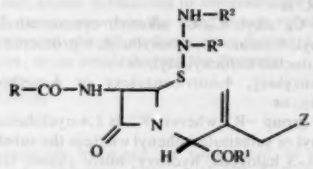
(V)

wherein R^1 is selected from the class consisting of hydroxyl, alkoxy having from 1 to 4 carbon atoms, trichloroethoxy, benzyloxy, p-methoxybenzyloxy, p-nitrobenzyloxy, benzhydryloxy, triphenylmethoxy, phenacyloxy, and p-halophenacyloxy;

Z is selected from the class consisting of hydrogen —O—alkyl, —O—CO—alkyl, —Br, —I, —N_3, —NH_2, —O—·

$CO-CH_3$, O—CO-NH_2 and 2-mercapto-5-methyl-1,3,4-thiadiazole;

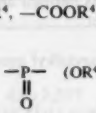
starting from a 3-acylamino-2β-thiohydrazo-azetidinone of structure:



(II')

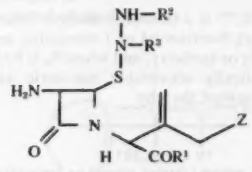
wherein R is selected from the class consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, cyano-methyl, thienylmethyl, naphthyl-methyl, phenyl-methyl, phenoxy-methyl, phenylisopropyl, phenoxy-isopropyl, pyridyl-4-thiomethyl, and tetrazolyl-1-methyl;

R^2 and R^3 are the same or different and represent -CN, or the radical $-COR^4$, $-COOR^4$,



$-CONHR^4$, where R_4 is a lower alkyl having from 1 to 4 carbon atoms or a benzyl group;

wherein the compound (II') is reacted with phosphorus pentachloride or phosphorus oxychloride in the presence of pyridine, the corresponding imino chloride is reacted with a lower aliphatic alcohol having from 1 to 4 carbon atoms, the imino-ether so formed is hydrolyzed with water in an acid medium, and the resultant 3-amino-2β-thiohydrazoazetidinone of structure:



(IV')

in which R^1, R^2, R^3 and Z have the meanings given heretofore,

is reacted in a suitable solvent at a temperature between −100° and +120° C with an aluminum oxide or silicon oxide or with sodium, potassium or ammonium hydroxide, or a sodium, potassium or lithium alcoholate to finally give the desired compound (V) which is isolated and purified in known manner.

4,012,382

α-AMINO AND α-FORMYL-α-(p-ACYLOXYPHENYL) ACETAMIDOCEPHALOSPORANIC ACID DERIVATIVES

Daniel Bouzard, 2, Rue de Centre, 95130 Franconville, France, and Abraham Weber, 55, Blvd. Soult, 75012 Paris, France

Filed May 27, 1975, Ser. No. 581,054

Claims priority, application United Kingdom, June 5, 1974, 24848/74

Int. Cl.² C07D *501/36*

U.S. Cl. 260—243 C **1 Claim**

1. The compound which is 7-D-α-amino-α-(p-acetoxyphenylacetamido)-3-[(1,2,3-triazol-5-yl)-thiomethyl]-3-cephem-4-carboxylic acid when substantially free of the L isomer.

4,012,383

Δ²·³-1,4-MORPHOLINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF USEFUL IN PREPARATION OF ANTIBACTERIA AGENTS

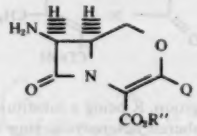
Bernard R. Belleau, Westmount; Terrence W. Doyle, Candiac; Bing Yu Luh, and Terry T. Conway, both of Brossard, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,271

Int. Cl.² C07D *265/00, 273/00, 295/00*

U.S. Cl. 260—244 R **9 Claims**

1. A compound of the formula



VIII

wherein Q is methyl and R'' is hydrogen or an easily cleavable ester carboxyl-protecting group, or carboxylic acid or acid addition salts thereof.

4,012,384

7-(N-METHYL-N-ALKYLAMINO)-1,3,5-TRIAZAADAMANTANES

Arnold T. Nielsen, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 28, 1975, Ser. No. 599,901

Int. Cl.² C07D *251/72*

U.S. Cl. 260—248 NS **2 Claims**

1. A compound represented by the formula:

wherein R is an alkyl selected from the group consisting of C_2H_5, C_3H_7, C_4H_9, C_5H_{11}, C_6H_{13}, and C_7H_{15}.

4,012,385

ANTIBACTERIAL QUINOXALINE 1,4-DIOXIDES

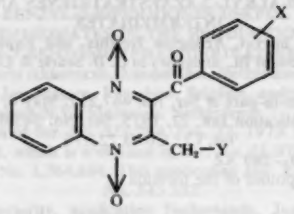
John P. Dirlam, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,480

Int. Cl.² C07D *241/52*

U.S. Cl. 260—250 QN **9 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of hydrogen, hydroxy, nitro, fluoro, chloro, bromo, alkyl having from one to five carbon atoms and alkoxy having from one to five carbon atoms;

and Y is selected from the group consisting of hydroxy, formyloxy, alkanoyloxy having from two to six carbon atoms, alkanoylthio having from two to six carbon atoms, alkylthio having from one to five carbon atoms, alkylsulfinyl having from one to five carbon atoms and alkylsulfonyl having from one to five carbon atoms.

4,012,386

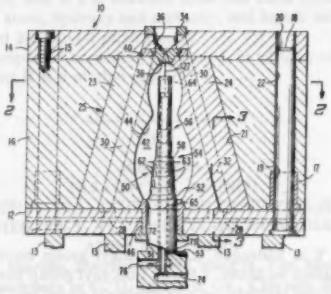
PROCESS FOR MAKING PLASTIC BOWLING PINS

Charles C. Davis, Princeton, N.J., assignor to Stokes-Trenton, Inc., Trenton, N.J.

Continuation-in-part of Ser. No. 405,582, Oct. 11, 1973, abandoned. This application Sept. 24, 1975, Ser. No. 616,473

Int. Cl.² B29C *1/06;* **B29F** *1/022*

U.S. Cl. 264—250 **5 Claims**



1. A method of making a high impact plastic bowling pin as a two-part product having as one of its parts a hollow body formed open at one end and shaped wholly by a molding operation from a thermoplastic material in the polyolefin group that includes high density polyethylene, and having as its second part a base plug sealably closing said end of the body, that comprises the steps of injecting said material in a molten liquid state into a molding cavity the wall of which has a configuration corresponding closely to the external contouring and dimensions of the body of the finished pin; deflecting the injected material within the cavity transversely of the cavity in paths extending radially outwardly from the axis thereof, over the full circumference of the cavity; thereafter subjecting the injected material while it is still in a molten state to a compressive action until it becomes an integral, homogeneous, thick-walled mass of uniform high density over its entire area; cooling the molded body with the cavity to an extent effective to relieve the compressive force; separating the molding cavity from the body; and finally; applying said base plug in position sealably closing the open end of the body to provide the finished two part product, the side wall of the bowling pin varying in thickness and in external diameter, the step of compressing said material including varying the compressive forces exerted against the injected material by applying, in every area of the molding cavity taken longitudinally thereof, a compressive force that is selected in relation to the wall thickness and diameter of the bowling pin body occurring in that area.

4,012,387

BENZO-[g]PYRIDO[2,1-b] QUINAZOLINONES

Charles F. Schwender, Lebanon, and Brooks R. Sunday, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 18, 1975, Ser. No. 614,399

Int. Cl.² C07D *471/04*

U.S. Cl. 260—251 A **2 Claims**

1. 6-oxo-6H-benzo[g]pyrido[2,1-b]quinazoline-3-carboxylic acid.

2. 6-oxo-6H-benzo[g]pyrido[2,1-b]quinazoline-1-carboxylic acid.

4,012,388

HERBICIDAL 4-PYRIMIDINONES AND PYRIMIDINETHIONES

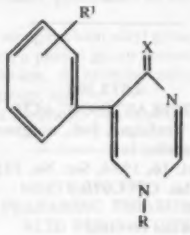
James Richard Beck, and Robert Peter Gajewski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 11, 1975, Ser. No. 639,526

Int. Cl.² C07D *239/22*

U.S. Cl. 260—251 R **6 Claims**

1. A compound of the formula



wherein

R represents C_1–C_3 alkyl;

R^1 represents bromo, chloro or trifluoromethyl;

X represents oxygen or sulfur.

4,012,389

2- OR 3-PHENYL 1,4-DISUBSTITUTED PHENYL PIPERAZINES

Hugo Zellner, deceased, late of Linz-Ebelsberg, Austria (by Gertroud Zellner, administratrix), assignor to Donau-Pharmazie Gesellschaft m.b.H., Linz, Austria

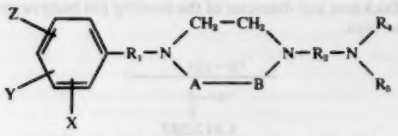
Division of Ser. No. 333,497, Feb. 20, 1973, Pat. No. 3,935,214, which is a continuation-in-part of Ser. No. 848,395, July 23, 1969, abandoned. This application Oct. 31, 1975, Ser. No. 627,690

Claims priority, application Austria, July 26, 1968, 7306/68

Int. Cl.² C07D *241/00, 401/06*

U.S. Cl. 260—268 R **14 Claims**

1. A 1,4-disubstituted phenyl piperazine compound of the formula



in which

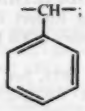
X, Y, and Z are members selected from the group consisting of hydrogen, halogen, trifluoro lower alkyl, hydroxyl, lower alkoxy, and phenyl substituted lower alkoxy;

R_1 is lower alkyl with 1 to 3 carbon atoms;

R_2 is lower alkyl;

R_4 and R_5 are members selected from the group consisting of lower alkyl and together with the nitrogen to which they are attached, form piperidino or pyrrolidino and

one of the groups A and B is the methylene group of the formula $-CH_2-$, while the other one of the groups A and B is the phenyl substituted methylene group of the formula



or their pharmaceutically acceptable acid addition salts.

4,012,390

VINBLASTINOIC ACID

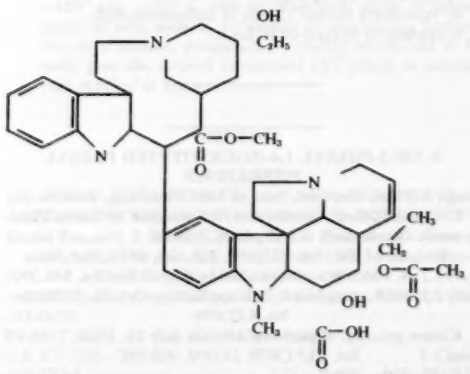
George J. Cullinan, Trafalgar, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 16, 1974, Ser. No. 515,134

Int. Cl.² C07D *519/04*

U.S. Cl. 260—287 B **1 Claim**

1. A compound of the formula



said compound being vinblastinoic acid.

4,012,391

11β-ALKYL-2-AZAESTRATRIENES AND INTERMEDIATES

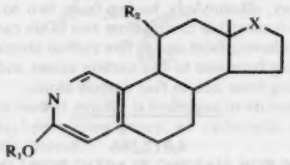
Robert J. Chorvat, Arlington Heights, and Raphael Pappo, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 467,217, May 6, 1974. This application Jan. 22, 1975, Ser. No. 543,027

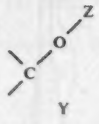
Int. Cl.² C07D *221/16*

U.S. Cl. 260—289 AZ **14 Claims**

1. A compound of the formula

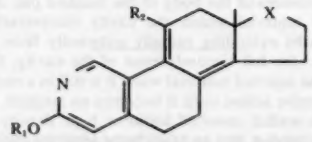


wherein R_1 is a lower alkyl group having 1 to 7 carbon atoms inclusive or a cycloalkyl group having 4–8 carbon atoms inclusive, R_2 is a lower alkyl group having 1 to 4 carbon atoms inclusive, and X is a carbonyl group or a group of the formula



wherein Y is hydrogen, a lower alkyl group having 1 to 7 carbon atoms inclusive, a lower 1-alkynyl group having 2 to 7 carbon atoms inclusive or a propadienyl group and Z is hydrogen.

10. A compound of the formula



wherein R_1 is a lower alkyl group having 1–7 carbon atoms inclusive or a cycloalkyl group having 4–8 carbon atoms inclusive, R_2 is a lower alkyl group having 1–4 carbon atoms inclusive, X is a carbonyl or β-hydroxymethylene group and the dotted line represents an optionally doubly-bonded linkage.

4,012,392
2-BENZYL-4-PIPERIDONES USEFUL AS INTERMEDIATES IN THE PRODUCTION OF 6,7-BENZOMORPHAN DERIVATIVES

Antony Marie Akkerman, Amsterdam, Netherlands, and Paul Adriaan Jan Janssen, Vosselaar, Belgium, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

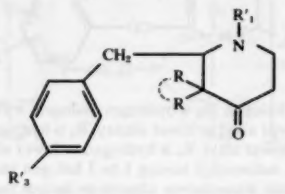
Division of Ser. No. 331,764, Feb. 12, 1973, Pat. No. 3,883,536, which is a division of Ser. No. 41,079, May 27, 1970, Pat. No. 3,764,606. This application Jan. 23, 1975, Ser. No. 543,352

Claims priority, application Netherlands, June 4, 1969, 6908527; June 4, 1969, 6908528; June 4, 1969, 6908529

Int. Cl.² C07D *211/44, 221/20*

U.S. Cl. 260—293.8 3 Claims

1. A compound selected from the group consisting of substituted 2-benzyl-4-piperidones having the formula



in which the substituents R, when taken separately, are methyl or ethyl, or, when taken together with the carbon atom to which they are bonded, form cyclopentyl or cyclohexyl, R'_1 is selected from the class consisting of hydrogen atom, methyl and benzyl, and R'_3 is selected from the class consisting of hydrogen atom, hydroxy and methoxy, and halide salts of said substituted 2-benzyl-4-piperidones.

2. A compound according to claim 1, in which each of said substituents R is a methyl group.

4,012,393
2-[5-(CYCLIC AMINO) ETHYL-10,11-DIHYDRO-5H-DIBENZO[a,d]-CYCLOHEPTEN-5- YL]-5-ALKYL-1,3,4-OXADIAZOLES AND CONGENERS

Charles S. Markos, Deerfield, and Chung H. Yen, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

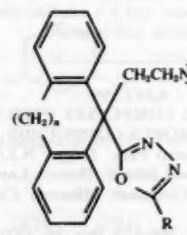
Filed Mar. 22, 1976, Ser. No. 668,886

Int. Cl.² C07D *413/06*

U.S. Cl. 260—293.54 5 Claims

1. A compound of the formula

(I)



wherein R is lower alkyl containing 1 to 6 carbon atoms; *n* is the integer 2 or 3; and -N is a cyclic secondary amine residue selected from the group consisting of azabicycloalkyl containing 6 to 9 carbon atoms and having at least 5 atoms in each ring, pyrrolidino, piperidino and hexamethyleneimino.

4,012,394
INDOLE DERIVATIVES

Marcel Descamps, Crainhem, and Henri Inion, Wemmel, both of Belgium, assignors to Labaz, Paris, France

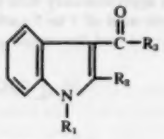
Division of Ser. No. 438,214, Jan. 31, 1974, Pat. No. 3,946,029. This application Aug. 4, 1975, Ser. No. 601,919

Claims priority, application United Kingdom, Feb. 16, 1973, 07866/73

Int. Cl.² C07D *401/06*

U.S. Cl. 260—293.61 3 Claims

1. An indole derivative represented by the formula:



and pharmaceutically acceptable acid addition salts thereof, wherein

R_1 represents

wherein

A represents an alkylene chain of from 2 to 6 carbon atoms and R_4 and R_5, which may be the same or different, are each an alkyl group having from 1 to 5 carbon atoms, or R_4 and R_5 are joined together to form with the nitrogen atom a piperidino, pyrrolidino or morpholino group,

R_2 represents

a branched-or straight-chain alkyl group having from 1 to 4 carbon atoms, a phenyl group optionally substituted by a fluorine, chlorine, or bromine atom, or a methoxy or cyclohexyl group; and

R_3 represents a 2-pyridyl, 3-pyridyl or 4-pyridyl group.

4,012,395
PROCESS FOR PREPARING THIAZOLIDINONE ACETIC ACID DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Karl-Otto Vollmer, Freiburg (Brsg), all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 553,715, Feb. 27, 1975, Pat. No. 3,971,794. This application Sept. 24, 1975, Ser. No. 616,233

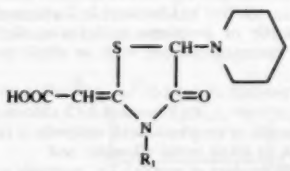
Claims priority, application Germany, Mar. 25, 1974, 2414345

Int. Cl.² C07D *295/12*

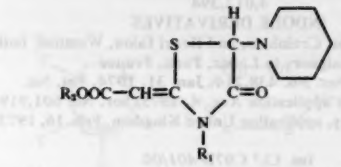
U.S. Cl. 260—293.68 7 Claims

1. A process for the preparation of compounds of the formula:

I



wherein R_1 is a lower alkyl of 1 to 4 carbon atoms, wherein a compound of the formula:



II

in which R_1 has the same meaning as above and R_2 is an alkyl radical containing 2 to 6 carbon atoms, is treated at a low temperature with an approximately 40% solution of hydrogen bromide in an organic acid of 1 to 5 carbons, whereafter the acid mixture is removed and the amino acid isolated.

4,012,396

PROCESSES AND INTERMEDIATES FOR CIS OR TRANS 2-OR 3-(1-ACYL-3-VINYL-4-PIPERIDINE)ACETIC OR PROPIONIC ACID ESTERS

Guenter Grethe, North Caldwell, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 362,604, May 21, 1973, abandoned, which is a division of Ser. No. 100,370, Dec. 21, 1970, abandoned. This application May 23, 1975, Ser. No. 580,494

Int. Cl.² C07D *211/34*

U.S. Cl. 260—293.77 **1 Claim**

1. A process for the preparation of optically active cis or trans 2-(1-benzoyl-3-vinyl-4-piperidine)acetic acid or lower alkyl ester, antipode or racemate thereof or optically active cis or trans-3-(1-benzoyl-3-vinyl-4-piperidine)propionic acid or lower alkyl ester, antipode or racemate thereof which comprises the steps of:

a. treating the corresponding optically active cis or trans 2- or 3-(3-ethyl-4-piperidine)acetic or propionic acid lower alkyl ester, antipode or racemate thereof with a chlorinating agent;

b. irradiating the product of step (a), i.e., optically active cis or trans 2- or 3-(1-chloro-3-ethyl-4-piperidine)acetic or propionic acid lower alkyl ester, antipode or racemate thereof;

c. treating the product of step (b), i.e., optically active cis or trans 2- or 3-[3-(2-chloroethyl)-4-piperidine]acetic or propionic acid lower alkyl ester, antipode or racemate thereof, with benzoyl chloride;

d. treating the product of step (c), i.e., optically active cis or trans 2- or 3-[1-benzoyl-3-(2-chloroethyl)-4-piperidine]acetic or propionic acid lower alkyl ester, antipode or racemate thereof, with an alkali metal hydroxide;

e. treating the product of step (d), i.e., optically active cis or trans 2- or 3-[1-benzoyl-3-(2-chloroethyl)-4-piperidine]acetic or propionic acid, antipode or racemate thereof, with an alkali metal alkoxide; and

f. esterifying the product of step (e), i.e., optically active cis or trans 2- or 3-(1-benzoyl-3-vinyl-4-piperidine)acetic or propionic acid, antipode or racemate thereof, with an alkanol, to yield the desired end product.

4,012,397

2-BENZOYL-3-AMINO-PYRIDINES

Walter von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

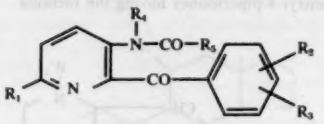
Continuation-in-part of Ser. No. 347,361, April 3, 1973, Pat. No. 3,875,176, Division of Ser. No. 497,750, Aug. 15, 1974, Pat. No. 3,969,361. This application Feb. 26, 1976, Ser. No. 661,817

Claims priority, application Austria, May 10, 1972, 4113/72

Int. Cl.² C07D *213/75*

U.S. Cl. 260—295.5 A **19 Claims**

1. A pyridine compound of the formula



where R_1 is halogen, R_2 is hydrogen, halogen, trifluoromethyl, hydroxy, lower alkyl or lower alkoxy, R_3 is hydrogen, halogen, hydroxy or lower alkyl, R_4 is hydrogen or lower alkyl and R_5 is lower alkyl, halomethyl having 1 to 3 halogen atoms all halogens being the same, lower alkenyl or hydroxymethyl, lower carbalkoxymethyl, alpha aminolower alkyl, alpha aminolower alkyl substituted with (1) carbophenoxy, (2) carbobenzyloxy, (3) lower alkanoyl or (4) lower alkyl or a pharmacologically acceptable salt thereof.

4,012,398

QUATERNARY HALIDES OF MINK OIL AMIDES

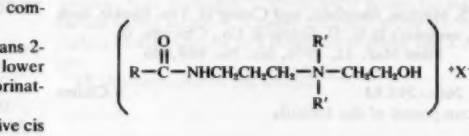
Donald E. Conner, Clifton, and Arnold W. Fogel, Park Ridge, both of N.J., assignors to Van Dyk & Company, Incorporated, Belleville, N.J.

Filed Sept. 16, 1975, Ser. No. 613,965

Int. Cl.² C11C *3/00;* **A61K** *7/06, 31/205, 31/16*

U.S. Cl. 260—404.5 **5 Claims**

1. As novel compositions of matter, amido propyl dialkyl amino beta hydroxy ethyl ammonium halides of mink oil having the formula



wherein RCO is the mink oil fatty acid mixture, R′ is an alkyl group of 1–2 carbon atoms, and X is a halide selected from the group consisting of chloride and bromide.

4,012,399

TRANSITION METAL COMPLEXES WITH TRIVALENT PHOSPHORUS COMPOUNDS

Ingenuin Hechenbleikner, Park Ridge, N.J.; Thomas G. Kugele, Cincinnati, and John F. Hussar, Loveland, both of Ohio, assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

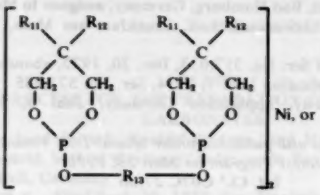
Division of Ser. No. 208,927, Dec. 16, 1971, Pat. No. 3,959,200, which is a division of Ser. No. 84,494, Oct. 29, 1970, Pat. No. 3,661,843. This application Nov. 4, 1975, Ser. No. 628,787

Int. Cl.² C07F *15/04*

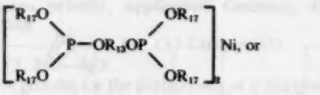
U.S. Cl. 260—439 R **26 Claims**

1. A compound having one of the formulae

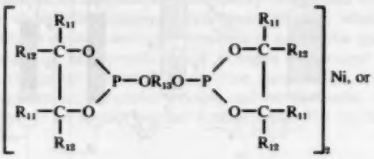
(1)



(2)

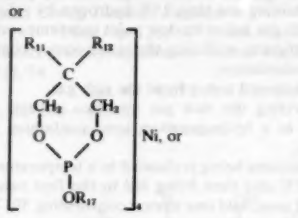


(3)

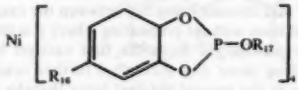


where R_{11} and R_{12} are hydrogen or lower alkyl, R_{13} is lower alkylene of at least 2 carbon atoms or alkyleneoxyalkylene having at least 2 carbon atoms in each alkylene group and R_{17} is hydrocarbyl or halo lower alkyl where the halogen has an atomic weight of 35 to 80,

(4)

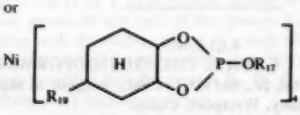


(5)



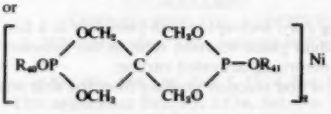
where R_{16} is hydrogen or alkyl,

(6)



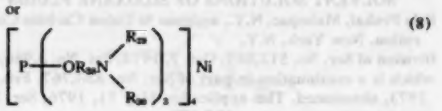
where R_{19} is hydrogen or hydrocarbyl,

(7)



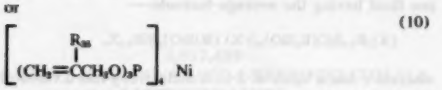
wherein R_{40} and R_{41} are hydrocarbyl or halo alkyl wherein the halogen has atomic weight of 35 to 80,

(8)



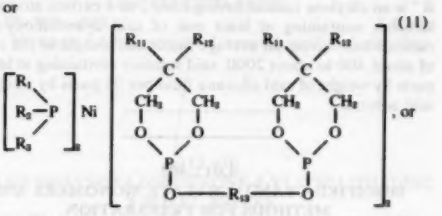
where R_{29} is lower alkylene and R_{29} and R_{30} are lower alkyl, or (9) tris (trineopentyl phosphite) nickel monocarbonyl,

(10)

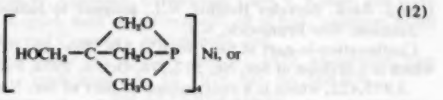


where R_{35} is hydrogen or methyl,

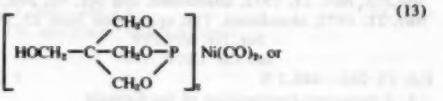
(11)



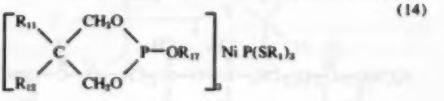
(12)



(13)



(14)



where R_1 is hydrocarbyl.

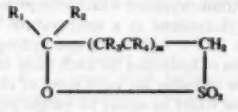
4,012,400

PREPARATION OF SULFONATES FROM SULTONES

John J. van Venrooy, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed Apr. 22, 1975, Ser. No. 570,931
Int. Cl.² C07F 5/06
U.S. Cl. 260—448 R 8 Claims

1. A process for the preparation of aluminum trialkyl sulfonates which comprises reacting a long chain trialkyl aluminum at a temperature between about 100° C. and about 250° C., with a sultone of the structure:



where R_1, R_2, R_3, and R_4 are hydrogen or lower alkyl and *m* is an integer of from 1 to 2.

4,012,401
SOLVENT SOLUTIONS OF SILOXANE FLUIDS

Bela Prokai, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 512,861, Oct. 7, 1974, Pat. No. 3,966,650, which is a continuation-in-part of Ser. No. 334,767, Feb. 22, 1973, abandoned. This application May 11, 1976, Ser. No. 685,139

Int. Cl.² C07F 7/10, 7/18

U.S. Cl. 260—448.2 N **7 Claims**

1. A composition suitable for use in the production of high resilience polyether urethane foam consisting essentially of an organic solvent solution of a cyanoalkoxy-alkyl modified siloxane fluid having the average formula

$$(X)_xR_{3-x}SiO(R_2SiO)_y[(X)(R)SiO]_zSiR_{3-x}X_x$$

wherein x has a value of 2 to 6 inclusive; y has a value of 0 to 6 inclusive; z has a value of 0 to 1 inclusive; R is a lower alkyl or phenyl radical; and X is a cyanoalkoxy-alkyl radical having the formula $—(O)_nR'OR''CN$ where n has a value of 0 or 1, R′ is an alkylene radical having from 3 to 8 carbon atoms and R″ is an alkylene radical having from 2 to 4 carbon atoms said siloxane containing at least one of said cyanoalkoxy-alkyl radicals and having an average molecular weight in the range of about 400 to about 2000, said solution containing at least 5 parts by weight of said siloxane fluid per 95 parts by weight of said solvent.

4,012,402
MODIFIED CYANOACRYLATE MONOMERS AND METHODS FOR PREPARATION

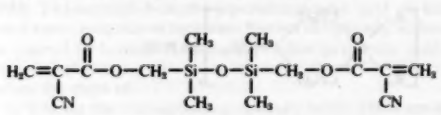
Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 633,146, Nov. 18, 1975, which is a division of Ser. No. 512,276, Oct. 4, 1974, Pat. No. 3,975,422, which is a continuation-in-part of Ser. Nos. 308,375, Nov. 21, 1972, abandoned, and Ser. No. 308,376, Nov. 21, 1972, abandoned. This application June 23, 1976, Ser. No. 699,299

Int. Cl.² C07F 7/10

U.S. Cl. 260—448.2 N **1 Claim**

1. A monomer composition of the formula



4,012,403
SYNTHESIS OF MERCAPTO-SUBSTITUTED SILICON COMPOUNDS

Jeffrey Yick Pui Mui, Tarrytown, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 611,676, Sept. 9, 1975, abandoned, which is a continuation of Ser. No. 216,728, Jan. 10, 1972, abandoned. This application Mar. 18, 1976, Ser. No. 667,987

Int. Cl.² C07F 7/18

U.S. Cl. 260—448.8 R **1 Claim**

1. The process of reducing β-cyanoethyltrialkoxysilane to mercaptopropyltrialkoxysilane which comprises reacting said cyanoethyltrialkyloxysilane at a temperature between about 50° C and about 300° C with sulfur and hydrogen in the ratio of at least 3 moles of hydrogen for each mole of the silane and at least one mole of sulfur for each mole of the silane, in the presence of about 0.001 to about 10 weight percent based on the weight of the silane, sulfur and hydrogen, of a sulfide or polysulfide of a transition metal consisting of cobalt, nickel, titanium, rhenium and molybdenum.

4,012,404
PROCESS FOR PRODUCING HIGH-METHANE GAS

Helmut Liebgott, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

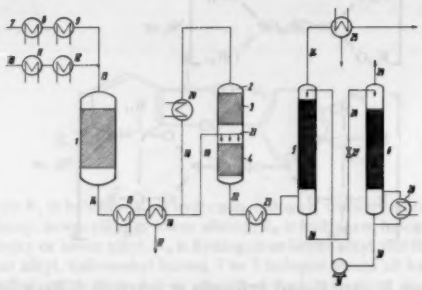
Continuation of Ser. No. 317,033, Dec. 20, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,985

Claims priority, application Germany, Jan. 3, 1972, 2200004

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C07C 27/06

U.S. Cl. 260—449 M **3 Claims**



1. Process for producing high-methane gas which comprises:

a. catalytically cracking liquid hydrocarbons with water vapor at elevated temperatures and pressures to produce a rich gas containing less than 15% hydrogen by volume;

b. cooling the rich gas below its dew point to a temperature below 150°C thereby reducing the water vapor content thereof by condensation;

c. separating condensed water from the rich gas;

d. thereafter dividing the rich gas into two streams and feeding same to a hydrogenation zone containing two catalyst layers,

i. one of said streams being preheated to a temperature of at least 250°C and then being fed to the first catalyst layer of said zone, said one stream constituting 50–70% of the total rich gas,

ii. the other of said streams being fed between the catalyst layers of said zone without preheating where it is mixed with the gas discharged from the first catalyst layer thereby cooling same and thereafter further reacting said mixture in the second catalyst layer thereby producing a product gas; and

e. scrubbing the product gas leaving the hydrogenation zone to remove carbon dioxide.

4,012,405
PRODUCTION OF ETHYL CHLOROTHIOFORMATE

Carlo G. Alesandrini, Jr., Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 28, 1975, Ser. No. 636,266

Int. Cl.² C07C 154/00

U.S. Cl. 260—455 R **14 Claims**

1. A process for production of ethyl chlorothioformate comprising:

a. contacting ethyl mercaptan with phosgene in a first continuous liquid phase reaction zone in the presence of a catalyst comprising activated carbon;

b. removing a first reaction product from the first reaction zone;

c. contacting the first reaction product with a catalyst comprising activated carbon in a second continuous liquid phase reaction zone; and

d. removing a second reaction product comprising ethyl chlorothioformate from the second reaction zone.

4,012,406
PROCESS FOR THE PREPARATION OF DIARYL CARBONATES

Hans Josef Buysch, Krefeld-Bockum, and Heinrich Krimm, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 30, 1975, Ser. No. 618,057

Claims priority, application Germany, Oct. 10, 1974, 2447348

Int. Cl.² C07C *68/02*

U.S. Cl. 260—463 **9 Claims**

1. A process for the preparation of a diaryl carbonate by the reaction of an aromatic monohydroxy compound with phosgene under elimination of hydrogen chloride, wherein said reaction is carried out in the presence of a catalytic quantity of an aromatic heterocyclic basic nitrogen compound selected from the group consisting of pyridine, quinoxaline, imidazole, benzimidazole, pyrazole, triazole and benztriazole, or a salt thereof, or an adduct thereof formed under the reaction conditions.

4,012,407
2-CYANO INDAN-1,3-DIONES

Frank Peter Doyle, Leatherhead; Barrie Christian Charles Cantello, Horsham; Derek Richard Buckle, Redhill, and Harry Smith, Maplehurst, all of England, assignors to Beecham Group Limited, England

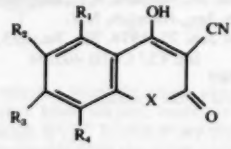
Filed Apr. 28, 1975, Ser. No. 572,226

Claims priority, application United Kingdom, May 4, 1974, 19721/74

Int. Cl.² C07C *121/75, 121/76*

U.S. Cl. 260—465 R **13 Claims**

1. A compound of the formula



or a pharmaceutically acceptable, nontoxic salt thereof or hydrate thereof, wherein R_1, R_2, R_3 and R_4 are each hydrogen, halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms or any two of the groups R_1, R_2, R_3, R_4 taken together with the carbon atoms to which they are joined complete a substituted or unsubstituted carbocyclic ring, and X is a bond, provided that the groups R_1, R_2, R_3 and R_4 are not all simultaneously hydrogen atoms.

4,012,408
LUBRICATING OIL ADDITIVES

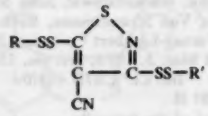
James A. White, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 486,148, July 5, 1974, Pat. No. 3,896,050. This application Dec. 19, 1974, Ser. No. 534,390

Int. Cl.² C07D *375/02*

U.S. Cl. 260—302 A **2 Claims**

1. A compound of the formula



wherein:

R and R′ = C_1 to C_{20} alkyl and may be the same or different.

4,012,409
N-(6-ETHYL-4-THIOCYANATO-2-BENZOTHIAZOLYL)-5-NITROFURAMIDE

Robert J. Alaimo, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,620

Int. Cl.² C07D *419/00*

U.S. Cl. 260—305 **1 Claim**

1. N-(6-ethyl-4-thiocyanato-2-benzothiazolyl)-5-nitrofuramide.

4,012,410
2-(4-METHOXYOXAZOLIDINONE-4-YL)THIAZOLIDINE T-BUTYL ESTERS

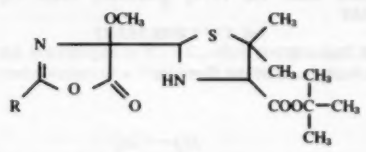
Charles W. Ashbrook, Greenwood; Gary V. Kaiser, and Gary A. Koppel, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 222,294, Jan. 31, 1972, abandoned. This application Apr. 14, 1975, Ser. No. 568,070

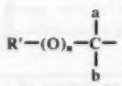
Int. Cl.² C07D *419/00*

U.S. Cl. 260—306.7 C **2 Claims**

1. The compound of the formula



wherein R is C_1–C_8 alkyl, phenyl, halophenyl, C_1–C_4 alkylphenyl, C_1–C_4 alkoxyphenyl, or hydroxyphenyl, or a group of the formula



wherein

R′ is α-thienyl, β-thienyl, α-furyl, β-furyl, phenyl, halophenyl, C_1–C_4 alkylphenyl, C_1–C_4 alkoxyphenyl or hydroxyphenyl,

n is 0 or 1,

a is hydrogen or C_1–C_3 lower alkyl,

b is hydrogen, C_1–C_3 lower alkyl, hydroxy, amino, 2,2,2-trichloroethoxycarbonylamino, benzyloxycarbonylamino, ethoxycarbonylamino, or t-butyloxycarbonylamino;

with the limitation that when *n* is 1, R′ is phenyl or substituted phenyl and *b* is hydrogen or C_1–C_3 lower alkyl.

4,012,411

HETEROCYCLIC ANNELATED 1-BENZOXEPIN-5-ONES

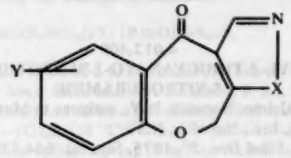
Sylvester Klutchko, Hackettstown; John Shavel, Jr., Mendham, and Max Von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 3, 1975, Ser. No. 554,841

Int. Cl.² C07D *498/04*

U.S. Cl. 260—307 H 1 Claim

1. A compound of the formula:



wherein X is oxygen, and Y is hydrogen.

4,012,412

2,5-DI-SUBSTITUTED 4-OXAZOLEALKANOIC ACID AND ESTERS

Tsutomu Yamanaka; Toshihiro Kobayakawa, both of Fukuoka; Mitsuhiro Konishi, Oita, and Kuniki Ikeda, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

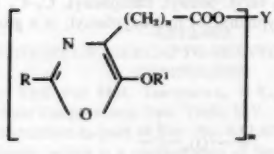
Filed Mar. 12, 1975, Ser. No. 557,692

Claims priority, application Japan, Mar. 13, 1974, 49-29548; Mar. 13, 1974, 49-29549; Mar. 13, 1974, 49-29550

Int. Cl.² C07D *263/42*

U.S. Cl. 260—307 R 6 Claims

1. A compound of the formula:



wherein *m* represents an integer of 1 to 2; R^1 represents an alkyl group having 1 to 4 carbon atoms; *n* represents an integer of 1 to 2; R represents a mono- or di-substituted phenyl group (in which the substituents are selected from the group consisting of a halogen atom, a methyl group, a methoxy group, a nitro group, a trifluoromethyl group, a phenyl group, a halogen-substituted phenyl group, a phenoxy group and a halogen-substituted phenoxy group), a furyl group, a halogen-substituted furyl group, a thienyl group or, a halogen-substituted thienyl group, when *m* represents an integer of 1, Y represents an hydrogen atom, an alkyl group having 1 to 2 carbon atoms, or a benzyl group; and when *m* represents an integer of 2, Y represents a trimethylene group.

4,012,413

ORGANIC COMPOUNDS AND PROCESS

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

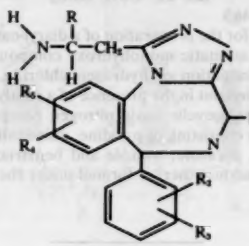
Continuation of Ser. No. 361,348, May 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 138,827, April 28, 1971, Pat. No. 3,759,943. This application Feb. 14, 1975, Ser. No. 550,120

The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.

Int. Cl.² C07D *487/04*

U.S. Cl. 260—308 R 4 Claims

1. A 1-(2-aminoalkyl)-6-phenyltriazolobenzodiazepine compound of the formula:



wherein R is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen or methyl; wherein R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, halogen, nitro, trifluoromethyl, and alkoxy, and alkylthio, in which the carbon chain moiety is of 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts thereof.

2. 1-[2-(dimethylamino)ethyl]-8-chloro-6-phenyl-4H-s-triazolo-[4,3-a][1,4]benzodiazepine.

4,012,414

2-(5-PHENYL-2-FURYL)IMIDAZOLES

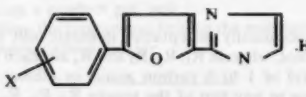
Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,295

Int. Cl.² C07D *405/04*

U.S. Cl. 260—309 6 Claims

1. A compound of the formula:



wherein X represents hydrogen, 2-nitro, 4-nitro, 4-amino, and 4-acetyl.

4,012,415

2-[5-(3,4-DIMETHOXYPHENYL)-2-FURYL]IMIDAZOLE HYDROCHLORIDE

Stanford S. Pelosi, Jr., and Chia-Nien Yu, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,446

Int. Cl.² C07D *405/04*

U.S. Cl. 260—309 1 Claim

1. The compound 2-[5-(3,4-dimethoxyphenyl)-2-furyl]imidazole hydrochloride.

4,012,416
2-[5-(3-TRIFLUOROMETHYLPHENYL)2-FURYL-]IMIDAZOLE HYDROCHLORIDE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,442
Int. Cl.² C07D *405/04*
U.S. Cl. 260—309 1 Claim

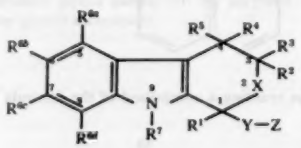
1. The compound 2-[5-(3-trifluoromethylphenyl)-2-furyl-]imidazole hydrochloride.

4,012,417
PROCESS FOR PREPARING PYRANO[3,4-b]INDOLE OR THIO PYRANO[3,4-b]INDOLE DERIVATIVES

Christopher A. Demerson, Montreal; Leslie G. Humber; Thomas A. Dobson, both of Dollard des Ormeaux, and Ivo L. Jirkovsky, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

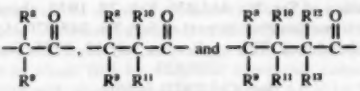
Continuation-in-part of Ser. No. 513,693, Oct. 10, 1974, Pat. No. 3,974,179, which is a continuation-in-part of Ser. No. 311,023, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,714, Sept. 15, 1972, Pat. No. 3,939,178, which is a continuation-in-part of Ser. No. 148,895, June 1, 1971, Pat. No. 3,843,681. This application Mar. 5, 1975, Ser. No. 555,506
Claims priority, application South Africa, May 18, 1972, 72/3344
Int. Cl.² C07D *491/04*, *495/04*
U.S. Cl. 260—326.5 SA 3 Claims

1. A process for preparing a compound of the formula Ia

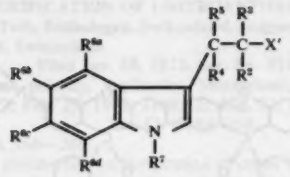


Ia.

in which R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower cycloalkyl, phenyl, benzyl and 2-thienyl, R^2, R^3, R^4 and R^5 are the same or different and are each selected from the group consisting of hydrogen and lower alkyl, R^{6a}, R^{6b}, R^{6c}, and R^{6d} are the same or different and selected from the group consisting of hydrogen, lower alkyl, lower cycloalkyl, hydroxy, lower alkoxy, benzyloxy, lower alkanoyloxy, phenyl, nitro, halo, mercapto, lower alkylthio, trifluoromethyl, amino and sulfamoyl, R^7 is selected from the group consisting of hydrogen, lower alkyl and lower alkenyl, X is selected from the group consisting of oxy and thio, Y is selected from the group consisting of carbonyl,

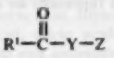


in which each of R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} is hydrogen or lower alkyl, and Z is hydroxy or lower alkoxy comprising: reacting a compound of the formula IIa



IIa.

in which R^2, R^3, R^4, R^5, R^7, R^{6a}, R^{6b}, R^{6c}, R^{6d}, and R^7 are as defined herein and X′ is hydroxy or mercapto with a compound of formula



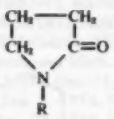
in which R^1, Y and Z are as defined herein, in the presence of an acid catalyst.

4,012,418
PROCESS FOR THE PREPARATION OF PYRROLIDONE-2

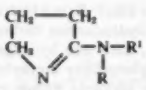
Sijbrandus E. Schaafsma, Beek, and Leonardus H. Geurts, Sittard, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sept. 23, 1975, Ser. No. 616,011
Claims priority, application Netherlands, Sept. 26, 1974, 7412694
Int. Cl.² C07D *207/26*
U.S. Cl. 260—326.5 FN 6 Claims

1. A process for the preparation of a pyrrolidone-2 compound of the formula:



wherein R is hydrogen or C_1 – C_4 alkyl, consisting of heating an aqueous solution of a 2-amino-Δ^1-pyrroline of the formula:



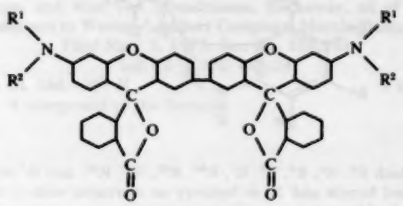
or the tautomeric 2-imino-pyrrolidine, wherein R is hydrogen or, when using the tautomeric 2-imino-pyrrolidine, R is hydrogen or a C_1 – C_4 alkyl group, and R^1 is hydrogen, a C_1 – C_4 alkyl group or a C_1 – C_3 alkylcyano group, by heating at a temperature of 90° – 290° C.

4,012,419
BISFLUORAN CHROMOGENIC COMPOUNDS, PREPARATION THEREOF, AND PRESSURE-SENSITIVE COPY SYSTEMS EMPLOYING SAME

David N. Vincent, Glenview, and Cheng Hsiung Chang, Chicago, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 329,294, Feb. 5, 1973, Pat. No. 3,821,010. This application Jan. 2, 1974, Ser. No. 430,141
Int. Cl.² C07D *519/00*
U.S. Cl. 260—335 3 Claims

3. A chromogenic compound represented by the formula



wherein R^1 and R^2 each represent an alkyl group.

4,012,420

9,10-SECOESTRANE DERIVATIVES AND THEIR PRODUCTION

Ulrich Eder; Gregor Haffer; Jurgen Ruppert; Gerhard Sauer, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

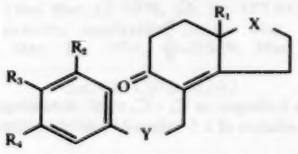
Continuation-in-part of Ser. No. 409,235, Oct. 24, 1973, Pat. No. 3,890,391. This application Apr. 21, 1975, Ser. No. 570,072

Claims priority, application Germany, Oct. 25, 1972, 2253089

Int. Cl.² C07D *317/46, 319/08*

U.S. Cl. 260—340.7 **6 Claims**

1. A 9,10-secoestrane of the formula



wherein R_1 is methyl or ethyl; R_4 is a hydrogen atom, alkoxy of 1–4 carbon atoms or hydrocarbon carbonyloxy of 1–12 carbon atoms; R_2 and R_3 each are hydrogen or alkoxy of 1–4 carbon atoms; X is alkylenedioxy-methylene of 5–6 ring members and wherein the alkylene group contains 2–6 carbon atoms; and Y is carbonyl or dialkoxy-methylene.

4,012,421

ORGANOTIN MITICIDAL AND INSECTICIDAL COMPOUNDS

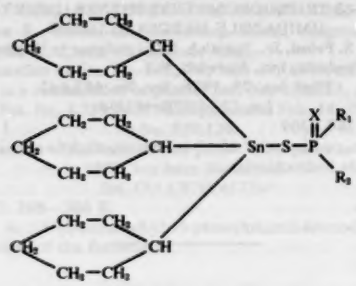
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 482,033, June 24, 1974, which is a division of Ser. No. 293,974, Oct. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 208,046, Dec. 10, 1971, abandoned. This application Dec. 29, 1975, Ser. No. 644,703

Int. Cl.² C07D *317/00*

U.S. Cl. 260—340.9 **3 Claims**

1. A composition of matter consisting of the formula



wherein R_1 is lower alkyl and R_2 is selected from the group consisting of furfuryloxy and alkyldioxolanealkoxy.

4,012,422

PROCESS FOR THE CYCLIZATION OF ARYL (METHYLSULFINYL)-METHYL KETONES AND NOVEL COMPOUNDS PRODUCED THEREBY

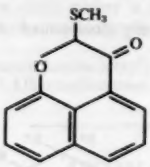
David T. Connor, 15 Westminster Drive, Parsippany, N.J. 07054, and Maximilian Von Strandtmann, 47 Erie Ave., Rockaway, N.J. 07866

Division of Ser. No. 464,706, April 26, 1974, Pat. No. 3,920,699. This application Apr. 25, 1975, Ser. No. 571,890

Int. Cl.² C07D *311/02*

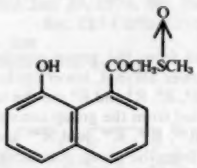
U.S. Cl. 260—345.2 **1 Claim**

1. A process for preparing a compound of the formula III:



III

which comprises reacting a compound of the formula IV:



IV

with an equivalent amount of trifluoroacetic acid, in an inert solvent, at reflux temperature.

4,012,423

PROCESS FOR THE PRODUCTION OF EPOXIDES

Arthur M. Brownstein, Wyckoff; John A. Jung, Somerset, and Robert Hansen, Belleville, all of N.J., assignors to Chem Systems, Inc., New York, N.Y.

Continuation of Ser. No. 444,836, Feb. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 348,970, April 9, 1973, abandoned. This application July 18, 1975, Ser. No. 597,037

Int. Cl.² C07D *301/02*

U.S. Cl. 260—348 R **16 Claims**

1. In a process for the preparation of oxirane compounds which comprises the deacyloxylation of vicinal hydroxyesters derived from oxygen, an olefin, and a carboxylic acid, wherein

the olefin is ethylene, propylene, a butylene, a pentene, styrene, or alphamethylstyrene, and the carboxylic acid is acetic, propionic, or butyric, the improvement which comprises performing said deacyloxylation reaction in the vapor phase at a temperature of from 250 to 600° C in the presence of a basic material having a pH of from 8 to 13 in a 0.1 molar aqueous solution.

4,012,424
CRACKING OF MIXTURES CONTAINING HYDROXYESTERS

Martin B. Sherwin, Wayne, N.J., and Jimmy Peress, West Haven, Conn., assignors to Chem Systems Inc., New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,738
Int. Cl.² C07D *301/02*
U.S. Cl. 260—348 R **7 Claims**

1. In a process for preparing an oxirane compound from the alkylene glycol monoester of an olefin and a carboxylic acid, wherein the olefin is ethylene, propylene, a butylene, a pentene, styrene, or alpha methylstyrene, and the carboxylic acid is acetic, propionic, or butyric, and wherein said alkylene glycol monoester is subjected to a cracking step in the vapor phase in the presence of a basic material, the improvement of: hydrolyzing a mixture containing a preponderance of alkylene glycol diester or esterifying a mixture containing a preponderance of alkylene glycol, thereby obtaining an effluent, said hydrolysis or esterification being performed so as to maximize the alkylene glycol monoester in such mixture and to achieve a mole fraction concentration thereof of at least 0.32 (based on the total amount of alkylene glycol diester, alkylene glycol monoester and alkylene glycol); and thereafter passing the effluent to the cracking step, without the prior separation of the alkylene glycol diester or the alkylene glycol from the alkylene glycol monoester.

4,012,425
ETHYLENE OXIDE PROCESS

Robert P. Nielsen, Houston, Tex., and John H. La Rochelle, Baton Rouge, La., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 471,398, May 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,349, Dec. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 216,188, Jan. 7, 1972, abandoned. This application Oct. 10, 1975, Ser. No. 621,269
Int. Cl.² C07D *301/10*
U.S. Cl. 260—348.5 R **29 Claims**

1. In the process for the production of ethylene oxide wherein ethylene is contacted in vapor phase with an oxygen-containing gas at ethylene oxide forming conditions at an elevated temperature of from 210° to about 285° C in the presence of a fixed bed of a silver metal-containing catalyst, the improvement which comprises employing as said catalyst an article comprising a porous refractory support having deposited on its exterior and pore surfaces from about 2% by weight to about 20% by weight of silver and, coincidentally deposited with silver, a total of from about 4.0×10^{-5} gew per kilogram of total catalyst to about 8.0×10^{-3} gew per kilogram of total catalyst of alkali metal present in final form on the support in the form of an oxide in which said oxide consists of oxides of cesium or rubidium or mixtures thereof.

4,012,426
PURIFICATION OF 1-NITROANTHRAQUINONE

Istvan Toth, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jan. 29, 1973, Ser. No. 327,621
Claims priority, application Switzerland, Feb. 1, 1972, 1499/72; Feb. 15, 1972, 2180/72; Aug. 22, 1972, 12403/72
Int. Cl. C09d *1/00*
U.S. Cl. 260—369 **13 Claims**

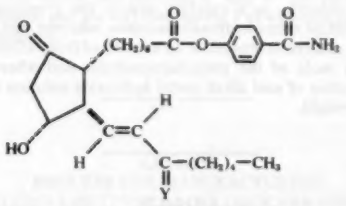
1. A process for the purification of crude 1-nitroanthraquinone containing an impurity comprising dinitroanthraquinone which process comprises treating said crude 1-nitroanthraquinone with an alkali metal hydroxide or alkaline earth metal oxide or hydroxide or with an alkali metal or alkaline earth metal salt of an acid or acid reacting compound selected from the group consisting of carbonic acid, monohydrogen phosphates, nitrous acid, boric acid, formic acid, acetic acid, benzoic acid, ascorbic acid, citric acid, salicylic acid, phenol, p-nitrophenol, uric acid and aminophenylsulphonic acids at a temperature above room temperature and in the presence of a first solvent which is stable under the reaction conditions and in which the 1-nitroanthraquinone is soluble at the treatment temperature, whereby said impurity forms a reaction product whose solubility in said first solvent is different to that of the 1-nitroanthraquinone, separating the dissolved 1-nitroanthraquinone from the reaction product and recovering the purified 1-nitroanthraquinone from said first solvent, the base or basic hydrolysable salt being employed in an amount at least sufficient to react with said impurity.

4,012,427
SUBSTITUTED PHENYL ESTERS OF PGE_1-TYPE PROSTAGLANDINS

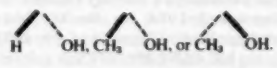
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 531,994, Dec. 12, 1974, which is a division of Ser. No. 431,599, Jan. 8, 1974, Pat. No. 3,968,140. This application Mar. 29, 1976, Ser. No. 671,229
Int. Cl.² C07C *177/00*
U.S. Cl. 260—389 **8 Claims**

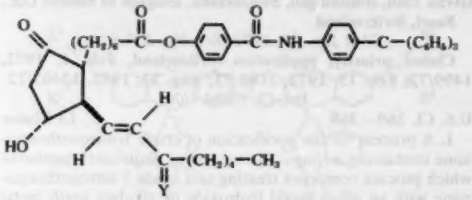
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein Y is



5. An optically active compound of the formula:



or racemic compound of that formula and the mirror image thereof, wherein Y is

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4,012,428

METHOD FOR PREPARING 3-METHYL-2-(4-HALOGENOPHENYL)-BUTYRONITRILE

Nobuo Ohno, Toyonaka; Takeaki Umemura, Takarazuka, and Tetsuhiko Watanabe, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 26, 1975, Ser. No. 635,548

Claims priority, application Japan, Nov. 26, 1974, 49-136712

Int. Cl.² C07C *121/66*

U.S. Cl. 260—465 G 4 Claims

1. A method for preparing a 3-methyl-2-(4'halogenophenyl)-butyronitrile which comprises isopropylating, at a temperature between room temperature and 120° C, a p-halogenophenylacetonitrile with an isopropyl halide in the presence of an organic quaternary ammonium salt selected from the group consisting of triethylbenzylammonium chloride, triethylbenzylammonium bromide, triethylbenzylammonium iodide, triethylbenzylammonium hydroxide, trimethylbenzylammonium chloride, trimethylbenzylammonium bromide, tetrabutylammonium chloride, tetrabutylammonium bromide, 3-phenoxybenzyl-triethylammonium bromide, tripropylbenzylammonium chloride, triethylpropylammonium bromide, cetyltriethylammonium bromide, m-octyltrimethylammonium chloride, and p-methoxybenzyltriethylammonium chloride, as a catalyst, and in the presence of an aqueous alkali metal hydroxide solution, wherein said ammonium salt catalyst is present in an amount of from 1/200 to 1/5 mole per mole of the phenylacetonitrile, and wherein the concentration of said alkali metal hydroxide solution is 10 to 70% by weight.

4,012,429

16,16-DIMETHYL 9-OXO-11α-HYDROXYMETHYL-15ε-HYDROXYPROSTA-5(CIS), 13(TRANS)-DIENOIC ACID DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Kiyoshi Sakai; Osamu Oda; Takashi Yusa; Mitsuo Yamazaki; Masaaki Sasaki, and Kazuhiko Sasagawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

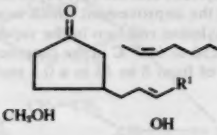
Filed Apr. 3, 1974, Ser. No. 457,564

Claims priority, application Japan, Apr. 19, 1973, 48-44444

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D 4 Claims

1. Compounds having the formula



wherein R^1 is 1,1-dimethylpentyl and R^2 represents hydrogen atom or a straight or branched alkyl group having from one to 6 carbon atoms, and pharmaceutically acceptable salts thereof.

4,012,430

PROCESS FOR THE PREPARATION OF CYCLOPROPANE DERIVATIVES

Pieter A. Verbrugge, and Elisabeth W. Uurbanus, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

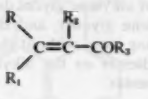
Continuation-in-part of Ser. Nos. 359,930, May 14, 1973, abandoned, and Ser. No. 359,931, May 14, 1973, Pat. No. 3,917,667. This application June 17, 1975, Ser. No. 587,574

Claims priority, application United Kingdom, May 16, 1972, 22911/72

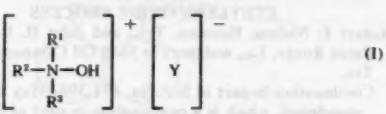
Int. Cl.² C07C *67/30, 102/00*

U.S. Cl. 260—468 H 8 Claims

1. A process for preparing esters and amides of gem-dihalocyclopropanecarboxylic acids which comprises contacting an aqueous phase containing an alkali metal hydroxide and an organic phase containing both a haloform and an alkenecarboxylic acid derivative of the formula



wherein R is hydrogen, alkyl or phenyl and R_1 and R_2 each independently is hydrogen or alkyl, R_3 is alkyloxy or substituted amino with the proviso that when R_3 is hydrogen, R_3 is only tert-alkyloxy or substituted amino, in the presence of as catalyst a quaternary onium compound of the formula



(I)

in which R^1, R^2 and R^3 each is alkyl or cycloalkyl of up to 40 carbon atoms and Y is an anion selected from hydroxide, iodide, bromide, chloride, fluoride, alkyl sulfate, tetrafluoroborate or tosylate.

4,012,431

PROCESS FOR PREPARING 5-OXA $PGF_{1\alpha}$ -TYPE COMPOUNDS

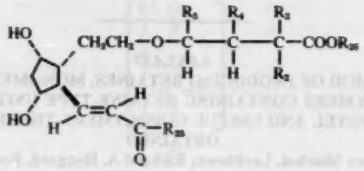
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 361,991, May 21, 1973, Pat. No. 3,931,279. This application Dec. 6, 1974, Ser. No. 530,086

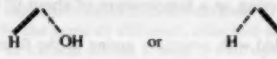
Int. Cl.² C07C *51/00, 177/00*

U.S. Cl. 260—468 D 10 Claims

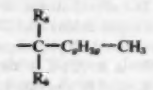
1. A process for preparing an optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Q_2 is

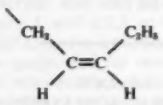


wherein R_3 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro; wherein R_2 is hydrogen or fluoro, with the proviso that R_2 is fluoro only when R_3 is hydrogen or fluoro; wherein R_4 and R_5 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that not more than one of R_3, R_4, and R_5 are alkyl; wherein R_{25} is



(1)

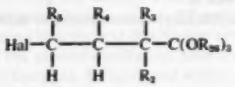
wherein C_pH_{2p} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_8R_9-$ and terminal methyl, wherein R_8 and R_9 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that R_9 is fluoro only when R_8 is hydrogen or fluoro, or



(2)

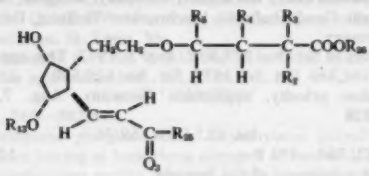
and wherein R_{26} is alkyl of one to 3 carbon atoms, inclusive; which comprises starting with an optically active compound of the formula

a. condensation with an omega-halo ortho ester of the formula



wherein Hal is chloro, bromo, or iodo, and wherein R_2, R_3, R_4, R_5, and R_{26} are as defined above, in the presence of a base selected from the class consisting of n-butyllithium, phenyllithium, triphenylmethyllithium, sodium hydride, and potassium t-butoxide, and, when the base is an organolithium compound, in dimethyl formamide or hexamethylphosphoramide;

b. transformation of the product of step a) to an optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Q_2, R_2, R_3, R_4, R_5, R_{13}, R_{25}, and R_{26} are as defined above, by hydrolysis; and

c. replacement of the R_{13} groups with hydrogen, by hydrolysis.

4,012,432

SULFONYL CARBAZATES AS BLOWING AGENTS

Byron A. Hunter, Woodbridge, Conn., assignor to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 476,752, June 5, 1974, Pat. No. 3,925,270. This application July 25, 1975, Ser. No. 599,304

Int. Cl.² C07C *149/40*

U.S. Cl. 260—470 **9 Claims**

1. The sulfonyl carbazate of claim **20** having the formula

$$R^1—OOC—NHNH—SO_2—Y—SO_2—NHNH—COO—R^1$$

wherein the R^1 substituents are the same or different and are alkyl having 1 to 12 carbon atoms, alkenyl having 2 to 12 carbon atoms, aryl, aralkyl, and alkaryl having 6 to 10 carbon atoms, and cycloalkyl having 5 to 8 carbon atoms; and

wherein Y is alkylene having 2 to 12 carbon atoms, arylene and alkarylene having 6 to 12 carbon atoms, and a group of the formula

$$—R^2—Z—R^3—$$

wherein Z is a single bond connecting R^2 and R^3, —O—, —S—, —SO—, SO_2—, $—NR^4—$wherein R^4 is hydrogen or an alkyl group with 1 to 4 carbon atoms, alkylene having 1 to 6 carbon atoms, and alkylidene having 2 to 3 carbon atoms, and wherein R^2 and R^3 are the same or different and are alkylene having 2 to 4 carbon atoms and phenylene.

4,012,433

PROCESS FOR MANUFACTURING 4-CHLORO-2-BUTYNYL m-CHLOROCARBANILATE

Jerry L. Rutter, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1975, Ser. No. 634,575

Int. Cl.² C07C *125/06*

U.S. Cl. 260—471 C **3 Claims**

1. In the process for manufacturing 4-chloro-2-butynyl N-(3-chlorophenyl)carbamate from 4-hydroxy-2-butynyl N-(3-chlorophenyl)carbamate, the improvement comprising reacting 4-hydroxy-2-butynyl N-(3-chlorophenyl)carbamate wtih a chlorinating agent selected from the group consisting of thionyl chloride and phosgene in the presence of a reaction-promoting amount of dimethylformamide.

4,012,434
NEMATIC COMPOUNDS AND MIXTURES

Ralf Steinsträsser, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

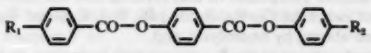
Division of Ser. No. 277,502, Aug. 3, 1972. This application Oct. 24, 1975, Ser. No. 625,550

Claims priority, application Germany, Aug. 7, 1971, 2139628

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 R **12 Claims**

1. A compound of the formula



wherein R_1 is straight-chain alkyl or straight-chain alkoxy of 1–7 carbon atoms or straight-chain alkanoyloxy of 2–7 carbon atoms, R_2 is straight-chain alkyl or straight-chain alkoxy of 1–7 carbon atoms.

4,012,435
CARBAMATES

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

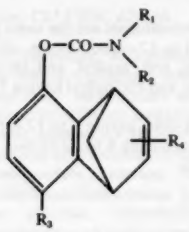
Filed Sept. 24, 1968, Ser. No. 762,144

Claims priority, application Switzerland, Sept. 25, 1967, 13375/67

Int. Cl.² C07C *125/06*

U.S. Cl. 260—479 C **6 Claims**

1. A carbamate of the general formula



in which R_1 represents a hydrogen atom or a lower alkyl group, R_2 represents a hydrogen atom, the methyl or acetyl group, R_3 represents a hydrogen atom, a lower alkoxy group or a carbamoyloxy group substituted by lower alkyl groups, R_4 represents a hydrogen atom or a methyl group, and in which the double bond in the 6,7-position may be hydrogenated.

4,012,436
CARBAMOYL CHLORIDES

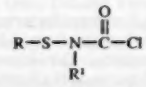
Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 317,311, Dec. 21, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,215

Int. Cl.² C07C *161/00*

U.S. Cl. 260—481 R **2 Claims**

1. A compound of the formula



where R is haloalkyl having 1 to 3 carbon atoms, having 1 to 5 chlorine or bromine atoms and having one carboalkoxy having 2 to 6 carbon atoms and R^1 is alkyl having 1 to 6 carbon atoms.

4,012,437
METHOD OF PRODUCING BETAINES, MONOMERS AND POLYMERS CONTAINING BETAINE-TYPE UNITS AND NOVEL AND USEFUL COPOLYMERS THEREBY OBTAINED

Norman Shachat, Levittown; Richard A. Haggard, Fort Washington, and Sheldon N. Lewis, Willow Grove, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

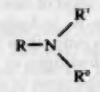
Filed Feb. 7, 1972, Ser. No. 224,268

Int. Cl.² C07C *101/24*, *65/54*

U.S. Cl. 260—482 R **23 Claims**

1. A method for producing a betaine-type product which comprises reacting, at a temperature of about 0° C. to about 100° C.,

1. acrylic acid with a tertiary amine of the formula



wherein R is (C_1-C_{24}) alkyl, allyl, benzyl, vinylbenzyl, hydroxyalkyl having 2 to 24 carbon atoms, (C_1–C_8)-alkyl substituted by an acryloxy, methacryloxy, acrylamido or methacrylamido, alkoxyalkyl having 3 to 24 carbon atoms, or a poly(alkoxy)alkyl group having 2 to 6 oxygen atoms and 2 to 3 carbon atoms in all except one of the terminal alkyl groups, the latter having 1 to 8 carbon atoms; R′ is a (C_1-C_8) alkyl group; R° is a (C_1–C_8) alkyl group, or R′ and R° may be joined together and form with the N atom of the tertiary amine, a ring selected from morpholino, thiomorpholino, N-alkylpiperidino, or piperazino or

2. acrylic acid with a polymer containing tertiary amine groups, of the formula above where R is (C_1–C_8) alkyl substituted by acryloxy, methacryloxy, acrylamido or methacrylamido, and R′ and R° are as defined above, or

3. acrylic acid with a mixture of a tertiary amine as defined in (2) and (b) a polymer of said tertiary amine, the molar ratio of acid to amine in the mixtures (1), (2), and (3) being from 0.1:1 to 10:1.

4,012,438
POLYCARBOXYLIC ACID COMPOSITIONS

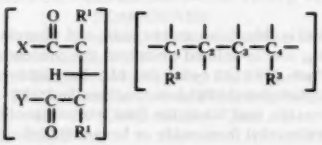
Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 163,534, July 9, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 835,735, June 23, 1969, abandoned, Ser. No. 835,736, June 23, 1969, abandoned, and Ser. No. 835,763, June 23, 1969, abandoned. This application Dec. 27, 1974, Ser. No. 537,051

Int. Cl.² C07C *55/24*

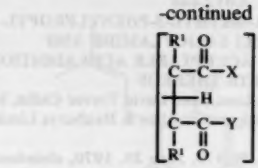
U.S. Cl. 260—485 R **4 Claims**

1. Alkyl or cycloalkyl tetracarboxylic acid compounds of the formula



A B

-continued



C

wherein A and C are monovalent succinic acid groups having attachment to B a either of the two carbon atoms of A or C having unsatisfied valences and a hydrogen atom attached to the other unsatisfied carbon atom; and whereby B is a connecting alkane or cycloalkane group of 8 to 30 carbon atoms having 2 of the above-described monovalent groups A and C, which may be the same or different, attached at carbon atoms 1 and 2 or at carbon atoms 1 and 3; and optionally having carbon atom 1 and carbon atom 4 connected by a 1–8 carbon methylene bridge; the remainder of the unsatisfied carbon valences of said bivalent hydrocarbon group being attached to hydrogen atoms; and wherein R^1 is H and R^2 and R^3 are H or the same or different alkyl groups; X and Y are the same or different groups having the structure: —OR, in which R is alkyl group having from 1 to 8 carbon atoms

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4,012,439

CONTINUOUS PRODUCTION OF n-BUTYLACRYLATE FREE FROM DIBUTYLETHER

Heinz Erpenbach, Surth near Cologne; Klaus Gehrmann, Erftstadt-Lechenich; Herbert Joest, Erftstadt-Liblar, and Peter Zerres, Erftstadt-Friesheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 14, 1975, Ser. No. 622,263

Claims priority, application Germany, Oct. 19, 1974, 2449811

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 R **1 Claim**

1. In the process for making n-butylacrylate by reacting acrylic acid with n-butanol in liquid phase in contact with an acid cation exchanger as a catalyst, the improvement, which comprises continuously introducing into, and reacting in, a reaction zone acrylic acid and n-butanol in a molar ratio within the range 1:1 and 1:2.5, at temperatures within the range 80 and 130° C, under a pressure within the range 3 and 15 atmospheres gauge, and for reaction periods within the range 20 and 90 minutes, the reaction zone being filled with an acid cation exchanger; delivering the resulting esterification mixture to a first distillation zone, distilling off near the head of the first distillation zone a ternary mixture consisting of butylacrylate, butanol and water, condensing the mixture and separating it into an organic phase and an aqueous phase, recycling the bulk of the aqueous phase to the head of the first distillation zone and removing the aqueous phase balance portion; removing concentrated acrylic acid from the bottom portion of the first distillation zone, distilling off higher boiling fractions and recycling the acrylic acid to the reaction zone; delivering the organic phase recovered from distillate of the first distillation zone to a second distillation zone, distilling off near the head of the second distillation zone a ternary mixture consisting of butylacrylate, butanol and water, condensing the mixture and separating it into an organic phase and an aqueous phase, recycling the organic phase to the head of the second distillation zone and removing the aqueous phase; delivering base product obtained in the second distillation zone and consisting of butylacrylate and butanol to a third distillation zone, distilling off near the head of the third distillation zone a butanol/butylacrylate-azeotrope, condensing the azeotrope and recycling it to the reaction zone, and removing pure n-butylacrylate through the bottom portion of the third distillation zone.

4,012,440

METHYLENE PHOSPHONATES OF OXYALKYLATED POLYALKYLENE POLYAMINES AND USES THEREFOR

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 90,837, Nov. 18, 1970, abandoned. This application Mar. 27, 1974, Ser. No. 455,344

Int. Cl.² C07F *9/34*

U.S. Cl. 260—502.5 **5 Claims**

1. Methylene phosphonates of oxyethylated polyalkylene polyamines having at least three nitrogen atoms, said methylene phosphonates having nitrogen-bonded methylene phosphonate units of the formula $—CH_2PO(OM)_2$, M being alkali metal, alkaline earth metal, hydrogen, alkyl ammonium or ammonium, wherein at least 50% of the nitrogen-bonded hydrogens of the polyamine are replaced with the methylene phosphonate units and the remainder of the nitrogen-bonded hydrogens are oxyethylated.

4,012,441

SULPHONIC DERIVATIVES HAVING THE STRUCTURE OF POLYOXAPOLYFLUOROALKANES

Enrico Pontoglio, Bollate (Milan); Ezio Strepparola, Treviglio (Bergamo), and Giancarlo Bernardi, Canzo (Como), all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed May 22, 1975, Ser. No. 579,943

Claims priority, application Italy, May 30, 1974, 23340/74

Int. Cl.² C07C *143/08*

U.S. Cl. 260—513 R **3 Claims**

1. An alkali polyoxapolyfluoroalkanesulphonate having the formula:

$$A—[CF_2O—(C_2F_4O)_m(CF_2O)_n—CF_2]—B$$

or a free acid thereof, in which the oxyperfluoroalkylene units —C_2F_4O— and —CF_2O— are randomly distributed along the chain; *m* and *n* are integers whose sum is a number from 2 to 50; and the *m*/*n* ratio is between 0.2 and 1.5; A is a monovalent radical —CH_2O—R—SO_3M, wherein R is propylene or butylene, M is an alkali metal or hydrogen; and B is the same as A or —CH_2OH.

4,012,442

PROCESS FOR PREPARING M-CHLOROBENZENE SULPHONYL CHLORIDE

Heinz-Ulrich Blank, Odenthal-Globusch; Karlfried Wedemeyer, Cologne, both of, and Josef Ebersberger, deceased, late of Bergen, Germany (by Thea Ebersberger, heiress), assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 465,649, April 30, 1974, Pat. No. 3,897,321. This application Mar. 17, 1975, Ser. No. 559,272

Claims priority, application Germany, May 24, 1973, 2326414

Int. Cl.² C07C *143/70*

U.S. Cl. 260—543 R **5 Claims**

1. Process for preparing m-chlorobenzene sulphonyl chloride which comprises reacting benzene sulphonyl chloride with chlorine in the presence of a Friedel-Crafts catalyst at a temperature of from −20° to 180° C.

4,012,443

INTEGRATED UREA-AMMONIA PROCESS

Andrea Bonetti, San Donato Milanese, Italy, assignor to Snam Progetti S.p.A., Milan, Italy

Filed June 12, 1975, Ser. No. 586,359
Claims priority, application Italy, June 12, 1974, 23895/74
Int. Cl.² C07C *126/00*
U.S. Cl. 260—555 A 1 Claim

1. An integrated process for the synthesis of urea and ammonia comprising:

a. feeding raw gases comprising N_2, H_2 and CO_2 Ar, CH_4 and CO to a primary CO_2 absorption zone wherein said gases are contacted with a concentrated ammonical solution and said CO_2 is removed to form an ammonium carbamate solution which separates from said raw gases but still contains an amount of CO_2 and NH_3, said concentrated ammonical solution having been obtained by absorbing with water the ammonia from the ammonia synthesis of step (n);

b. feeding said ammonium carbamate solution thus obtained to a urea synthesis zone for transforming said ammonium carbamate into urea;

c. forming said urea in said urea synthesis zone;

d. discharging from said urea synthesis zone a solution comprising urea, non-transformed carbamate, water, and ammonia to a stripping zone maintained at the same pressure as that of said urea synthesis zone;

e. obtaining from said stripping zone as the overhead products the decomposition products CO_2 and NH_3 of ammonium carbamate; then

f. feeding said decomposition products back to said urea synthesis zone; and

g. obtaining as the bottom product of said stripping zone in (e) an aqueous urea solution containing ammonia and non-transformed carbamate;

h. feeding said aqueous urea solution to a first distillation stage at a lowered pressure;

i. separating as overhead products of said first distillation stage water, NH_3 and CO_2, which water, NH_3 and CO_2, following condensation and rectification, are separated into:

i. a concentrated ammonium carbonate solution;

ii. liquid ammonia; and

j. obtaining as the bottom product of the distillation stage of (h) a urea solution;

k. distilling said urea solution of (j) in a second distillation stage at a still lower pressure and thereby obtaining a substantially pure urea solution product;

l. recovering as the overhead product of said second distillation stage after condensation a weakly concentrated ammonical solution of ammonium carbonate;

m. feeding said concentrated ammonium carbonate solution to said primary CO_2 absorption zone;

n. feeding said weakly concentrated ammonical solution of ammonium carbonate obtained in step (l) to a secondary CO_2 absorption zone so as to contact therein the raw gas stream comprising N_2, H_2, Ar, CH_4, CO and unabsorbed CO_2 and NH_3 treated in step (a) and further synthesizing ammonia from said treated gas stream;

o. feeding an ammonium carbonate solution obtained from the secondary CO_2 absorber to a condensation-rectification stage to which are added NH_3, CO_2 and water obtained as the overhead products from said first distillation stage at said lowered pressure;

p. obtaining from said condensation-rectification stage simultaneously

i. as the overhead product, liquid ammonia; and

ii. as the bottom product, said concentrated ammonium carbonate solution;

q. said liquid ammonia being recycled to said urea synthesis zone.

4,012,444

5-[1-HYDROXY-2-(1-METHYL-3-PHENYLPROPYL-)AMINOETHYL] SALICYLAMIDE AND PHYSIOLOGICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Lawrence Henry Charles Lunts, and David Trevor Collin, both of London, England, assignors to Allen & Hanburys Limited, London, England

Continuation of Ser. No. 50,979, June 29, 1970, abandoned. This application Nov. 30, 1973, Ser. No. 420,547
Claims priority, application United Kingdom, July 8, 1969, 34379/69
Int. Cl.² C07C *103/26*
U.S. Cl. 260—559 S 3 Claims

1. 5-[1-Hydroxy-2-(1-methyl-3-phenylpropyl)aminoethyl] salicylamide or a physiologically acceptable acid addition salt thereof.

4,012,445

BETA-AMINO CARBONYL CATALYSTS FOR POLYURETHANE PREPARATION

David Charles Priest, Charlotte, N.C.; Michael Ray Sandner, Charleston, and David John Trecker, S. Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 463,247, April 23, 1974, Pat. No. 3,954,749, which is a division of Ser. No. 309,906, Nov. 27, 1972, Pat. No. 3,821,131. This application Feb. 23, 1976, Ser. No. 659,997
Int. Cl.² C07C *103/50*
U.S. Cl. 260—561 A 2 Claims

1. 3-Diethylamino-N,N-dimethylpropionamide.

4,012,446

CAPPED POLYMERS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 518,596, Oct. 29, 1974, Pat. No. 3,931,319. This application Apr. 17, 1975, Ser. No. 568,901
Int. Cl.² C07C *87/46*
U.S. Cl. 260—567.6 P 4 Claims

1. A method of making a capped polymer which comprises (a) adding dropwise to a difunctional unsubstituted tertiary amine, a greater than molar equivalent of 1,4-dihalo-2-butene at a rate to maintain the resulting exothermic reaction at between about 60°–70° C, (b) heating the reaction mixture to a temperature immediately below the boiling point of the mixture for more than 2 hours, (c) cooling the mixture to about room temperature, (d) extracting, with a solvent, any unreacted 1,4-dihalo-2-butene from the resulting polyquaternary compound, and then (e) reacting the residue with an unsubstituted monotertiary amine at a temperature immediately below the boiling point of the mixture, said monotertiary amine having the formula $N(R^{III})(R^{IV})(R^{V})$ where R^{III}, R^{IV} and R^{V} are selected from the group consisting of (a) primary and secondary alkyls having 1 to 20 carbon atoms and (b) hydroxyethyl, and being in a quantity which is about equal to the molar equivalent of the halogen termini of the residue.

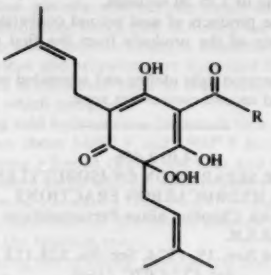
4,012,447

HYDROPEROXY-DESOXYHUMULONES

Trudi Sigg-Grütter, Winterthur, and Jost Wild, Uster, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Aug. 22, 1975, Ser. No. 606,813
Claims priority, application Switzerland, Sept. 9, 1974, 12156/74
Int. Cl.² C07C *49/44*
U.S. Cl. 260—586 D 4 Claims

1. Hydroperoxides of the formula:



(III)

wherein R represents a C_{1-6} alkyl group.

4,012,448

SYNTHESIS OF ADRIAMYCIN AND 7,9-EPIADRIAMYCIN

Thomas H. Smith, East Palo Alto; Allan N. Fujiwara, Sunnyvale; David W. Henry, Menlo Park, and William W. Lee, Palo Alto, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Jan. 15, 1976, Ser. No. 649,225

Int. Cl.² C07C *49/82*

U.S. Cl. 260—591 **1 Claim**

1. The compound which is 4-methoxy-6,11-dihydroxy-7,8-dihydro-5,9 (10H),12-naphthacenetrione.

4,012,449

PRODUCTION OF METHACROLEIN AND OXIDATION CATALYST USED THEREFOR

Yoshihisa Shikakura; Fumio Sakai, and Hitoshi Shimizu, all of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1975, Ser. No. 628,658

Claims priority, application Japan, Nov. 27, 1974, 49-135569

Int. Cl.² C07C *45/16*; B01J *21/02*; C07C *45/02*

U.S. Cl. 260—603 R **7 Claims**

1. An oxidation catalyst having the composition:

$$Co_aFe_bBi_cB_dSb_eNi_fJ_gMo_hO_i$$

in which J represents at least one element selected from the group consisting of potassium, rubidium and cesium, and the subscripts *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h* and *i* represent the numbers of cobalt, iron, bismuth, boron, antimony, nickel, J, molybdenum and oxygen atoms, respectively, with the proviso that the elements are present in a ratio so that when *h* is 12, *a* is 1 to 15, *b* 0.3 to 8, *c* 0.1 to 7, *d* 0.1 to 3, *e* 0.01 to 1, *f* 0 to 5, *g* greater than 0 but less than or equal to 1, and *i* is a number of 38 to 92 which number is determined by the total valences of the other elements.

4,012,450

CATALYTIC REACTIONS

Geoffrey Colin Bond, London, England, assignor to Johnson Matthey & Co., Limited, London, England

Division of Ser. No. 76,449, Sept. 29, 1970, abandoned. This application Apr. 4, 1975, Ser. No. 565,260

Claims priority, application United Kingdom, Oct. 1, 1969, 48277/69; Oct. 30, 1969, 53200/69; Nov. 14, 1969, 55883/69

Int. Cl.² C07C *45/08*, *45/10*

U.S. Cl. 260—604 HF **13 Claims**

1. A process for the hydroformylation of an olefin, comprising passing a mixture of said olefin, hydrogen and carbon monoxide through a reaction zone where said mixture contacts a catalyst comprising a solid porous support having absorbed thereon a solution of a catalytic compound selected from the group consisting of

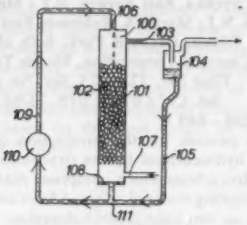
$RhH(CO)(PPh_3)_3$

$RhH(CO)(PPh_3)_2$

and

$RhH(CO)_2(PPh_3)_2$

where Ph is C_6H_5, in a solvent which is inert and essentially



involatile under the reaction conditions, maintaining an effective amount of said catalytic compound absorbed on said support by feeding additional solution into said zone countercurrently with respect to the passage of said mixture through said zone, collecting the gaseous reaction product after passage of the mixture through said catalyst and separating therefrom any solvent therein, collecting any catalyst solution fed to said zone which is not absorbed by said support and recycling the separated catalyst solution and solvent separated from said reaction product to said reaction zone for absorption on said porous support.

4,012,451

PROCESS FOR THE SEPARATION OF 4,4'-DICHLORODIPHENYLSULFONE

Kichiji Enoki; Takeo Fukui; Takeo Yamamoto; Toshirou Okada, and Yoshiaki Miyazaki, all of Takaoka, Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 650,158

Claims priority, application Japan, Jan. 31, 1975, 50-12433

Int. Cl.² C07C *147/06*

U.S. Cl. 260—607 AR **11 Claims**

1. A process for the separation of 4,4'-dichlorodiphenylsulfone from a reaction mixture containing said 4,4'-dichlorodiphenylsulfone and its isomers which comprises dissolving the reaction mixture in an organic solvent selected from the group consisting of trichloroethylene, tetrachloroethylene and mixture thereof and cooling the organic solution to precipitate 4,4'-dichlorodiphenylsulfone.

4,012,452

OLEFIN HYDRATION PROCESS

Orville D. Frampton, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 425,437, Dec. 17, 1973, Pat. No. 3,917,721. This application July 9, 1975, Ser. No. 594,423

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.² C07C *29/04*

U.S. Cl. 260—641 **9 Claims**

1. In a process for hydrating olefins to the corresponding alcohols by contacting the olefin and water vapor with a catalyst at elevated temperatures and pressures, the improvement which comprises employing as the catalyst, a preformed H_3PO_4 impregnated, water vapor treated silica xerogel, wherein said xerogel has a particle size passing through 3 mesh and retained on 20 mesh, a bulk density of 0.38–0.48 g/cc, a pore volume of 0.80–2.2 ml/g, a BET surface area in the range of 200–500 m^2/g and the following chemical composition in

terms of weight percent dry basis: SiO_2 over 99%, Fe_2O_3 0.01–0.03%; Na_2O 0.02–0.09%; and Al_2O_3 less than 0.4%, said xerogel having been contacted with water vapor at a temperature above 100° C. and less than 200° C., a relative humidity of about 30–100%, and a total pressure of 20–1500 psig.

4,012,453

PROCESS FOR THE PRODUCTION OF CHLOROFLUORINATED AROMATIC HYDROCARBONS

Henry R. Nychka, East Aurora, N.Y.; Morris B. Berenbaum, Summit, N.J.; Martin A. Robinson, East Amherst, and Richard E. Eibeck, Orchard Park, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 22, 1975, Ser. No. 642,873
Int. Cl.² C07C *25/18, 25/04, 25/13*
U.S. Cl. 260—649 F **55 Claims**

1. The process for the production of chlorofluorinated aromatic hydrocarbons by the oxychlorofluorination of aromatic hydrocarbons which comprises reacting a gaseous mixture of a starting material selected from an aromatic hydrocarbon and an aromatic hydrohalocarbon in which the halo atoms are selected from chloro and fluoro, or mixtures thereof, at least 0.10 mole oxygen in an oxygen-containing gas, at least 0.25 mole HCl or equivalent of Cl_2 for each C—H bond and C=C bond desired to be reacted in the starting material, and HF, in the presence of a Deacon catalyst supported by a stable, inert metal salt carrier, with the weight percentage of cation in the Deacon catalyst ranging from about 0.6–20 based on the total cation content of the Deacon catalyst and metal salt carrier, at elevated temperatures and with a contact time of from about 0.1–20 seconds.

4,012,454

IODINATION PROCESS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 15, 1975, Ser. No. 577,739
Int. Cl.² C07C *17/22*
U.S. Cl. 260—650 R **5 Claims**

1. A decarboxylation iodination process for substituting iodine atoms for silver carboxylate radicals which comprises reacting a composition consisting essentially of iodine and the silver salt of a carboxylic acid at a temperature of about 100° to 270° C in mole ratios of about 1.0 to 1.5 moles of iodine per mole equivalent of silver in said silver salt at a pressure from 1 to 100 atmospheres, wherein finely-divided said silver salt is added to said iodine under refluxing conditions, the said carboxylic acid being selected from the group of carboxylic acids consisting of isophthalic acid, 2,5-dibromoterephthalic acid, terephthalic acid and trimesic acid.

4,012,455

UPGRADING REFINERY LIGHT OLEFINS WITH HYDROGEN CONTRIBUTOR

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,296
Int. Cl.² C07C *15/02*
U.S. Cl. 260—668 R **1 Claim**

1. A method for upgrading hydrocarbons which comprises converting a gas oil boiling range hydrocarbon material combined with methanol by contact with a ZSM-5 type zeolite and faujasite as a suspension in a first riser conversion zone at a temperature within the range of 960° F to about 1200° F,

separating the product of said first riser conversion zone to recover a stream comprising C_3–C_5 olefins from higher boiling components comprising gasoline, heavy naphtha, light cycle oil and heavy cycle oil,

converting C_3–C_5 light olefins combined with methanol by contact with a ZSM-5 type zeolite and faujasite catalyst as a suspension in a second riser conversion zone at a temperature in the range of 500° to about 900° F and a contact time of 1 to 30 seconds,

separating the products of said second conversion zone in the presence of the products from the first conversion zone,

recycling separated light olefins and separated methanol to at least said second conversion zone.

4,012,456

METHOD FOR SEPARATION OF ISOBUTYLENE FROM C_4 HYDROCARBON FRACTIONS

Donat Nikolaevich Chaplits, ulitsa Pervomaiskaya, 9, kv. 36, Yaroslavl, U.S.S.R.

Filed Nov. 19, 1974, Ser. No. 525,113
Int. Cl.² C07C *11/08*
U.S. Cl. 260—677 A **2 Claims**

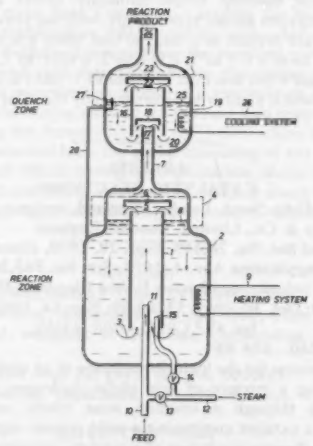
1. A method for separating high-purity isobutylene from C_4 hydrocarbon fractions which comprises treating said fractions with water at a temperature of from 70° to 110° C, under a pressure of from 16 to 23 atm., and a hydrocarbon fraction-to-water molar ratio being 1:5–20, in the presence of a polar solvent capable of dissolving both water and hydrocarbon in an amount of from 10 to 70% of the water weight and in the presence of an ion-exchange molded catalyst comprising a sulfonated styrene-divinylbenzene or di-isopropenylbenzene copolymer and a sulfonated thermoplastic material selected from the group consisting of sulfonated polyethylene, sulfonated polypropylene and sulfonated polyvinyl chloride, the sulfonated copolymer-to-sulfonated thermoplastic material weight ratio in said catalyst being equal to 1–4:1–2, respectively, whereby the isobutylene is converted to tert.butyl alcohol, followed by separating the hydrocarbon fraction from the tert.butyl alcohol solution, and thereafter dehydrating the tert.butyl alcohol to isobutylene at a temperature of from 80° to 110° C, under a pressure of 3 atm. maximum, and in the presence of said catalyst.

4,012,457

THERMAL CRACKING METHOD FOR THE PRODUCTION OF ETHYLENE AND PROPYLENE IN A MOLTEN METAL BATH

Larry D. Bredeson; Glenn R. McCullough, both of Houston, and Oran L. Wylie, Dallas, all of Tex., assignors to Shell Development Company, Houston, Tex.

Filed Oct. 6, 1975, Ser. No. 619,765
Int. Cl.² C07C *3/00, 5/00, 11/02*
U.S. Cl. 260—683 R **7 Claims**



1. In a process for the thermal cracking of hydrocarbons in

which a liquid or gaseous hydrocarbon feedstock selected from the group consisting of refinery gas, gasoline range material, naphthas, gas oils, residual oils, crude oils and mixtures thereof is introduced into a bath of molten metal in a reaction zone and in which gaseous reaction products comprising primarily ethylene and propylene are separated from the molten metal which is circulated back to the reaction zone, the improvement which comprises:

a. heating said hydrocarbon feedstock to a temperature of between about 1400° F and 1900° F in a reaction zone containing a forced circulation riser and in the presence of a molten metal wherein said feedstock is injected into said forced circulation riser thereby providing circulation of the hydrocarbon feedstock/ molten metal mixture within the reaction zone;
b. separating the resulting gaseous reaction products from the molten metal by gravity separation;
c. circulating the molten metal to a reheat zone surrounding the forced circulation riser and then back to the reaction zone;
d. routing the gaseous reaction products from said reaction zone through a transition zone to a quench zone containing a forced circulation riser, wherein the residence time of said gaseous reaction products in said transition zone is less than 0.2 seconds;
e. cooling said gaseous reaction products to a temperature of between about 800° F and about 1200° F in said quench zone by contacting said gaseous reaction products with a cooler molten metal;
f. separating the resulting gaseous reaction products from said cooler molten metal by gravity separation; and
g. circulating the cooler molten metal to a heat removal zone and then back to said quench zone.

4,012,458
EPOXY RESIN COMPOSITION COMPRISING A CYCLOPENTADIENE TYPE RESIN AND EPOXY HARDENER

Akira Wada, Kamakura, and Kazunob Karino, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed June 23, 1975, Ser. No. 589,537
Claims priority, application Japan, June 25, 1974, 49-72489
Int. Cl.² C08G *45/04*
U.S. Cl. 260—837 R **10 Claims**

1. An epoxy resin composition comprising

I. 5–80% by weight of a cyclopentadiene type resin having a hydroxyl value of 100–300 and a softening point of 50°–170° C, said resin consisting essentially of the reaction product of a cyclopentadiene monomer and a hydroxyl-containing monoolefinic monomer copolymerizable therewith and optionally a third monomer copolymerizable therewith by heat-polymerizing at a temperature of 200°–300° C a monomeric mixture containing at least 50% by weight of a cyclopentadiene monomer and less than 50% by weight of a hydroxyl-containing monoolefinic monomer copolymerizable therewith and less than 20% by weight of the total monomers of said third copolymerizable monomer,

II. 95–20% by weight of an epoxy resin which has at least two epoxy groups in the molecule, and

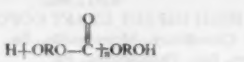
III. an effective amount of an epoxy resin hardener.

4,012,459
ACRYLIC FIBER OF IMPROVED PROPERTIES

Kenji Takeya; Hiroshi Suzuki, and Noboru Yamawaki, all of Okayama, Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 15, 1973, Ser. No. 388,675
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Int. Cl.² C08L *67/06*
U.S. Cl. 260—873 **9 Claims**

1. An acrylic fiber of improved hot-wet properties and improved elastic recovery which comprises a matrix of a fiber-forming acrylonitrile polymer containing at least 40 weight percent of acrylonitrile and any balance of one or more monomers copolymerizable therewith, said matrix forming from 50 to 99 weight percent of the total weight of fiber and discontinuously distributed within said matrix from about 1 to 50 weight percent based on the total weight of fiber of a polycarbonate of the formula



wherein R is the residue of an aliphatic or aromatic-alipathic dihydroxy organic compound after esterification to form a polycarbonate and n is an integer sufficient to provide a molecular weight of at least about 18,000, said polycarbonate being present in the form of a plurality of fibrils of a diameter in the range of about 0.05 to 5 microns and a length to diameter ratio of at least 10.

4,012,460
METHOD OF POLYMERIZING VINYL CHLORIDE WITH OLEFIN-ACRYLIC ESTER COPOLYMERS AND COMPOSITION THEREOF

Akio Takahashi, Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 251,100, May 8, 1972, abandoned. This application Feb. 24, 1975, Ser. No. 552,682
Int. Cl.² C08F *265/04*; C08L *33/08*
U.S. Cl. 260—878 R **13 Claims**

1. In a process for the preparation of a polymer of a vinyl halide by a twostage bulk polymerization of a vinyl halide monomer wherein polymerization is carried out in a first stage, during which a reaction mixture is subjected to high speed agitation until about 3 percent to about 15 percent of said monomer have been converted to polymer, and in which said polymerization is completed in a second stage, during which said reaction mixture is subjected to low speed agitation until the reaction has been completed, the improvement comprising polymerizing said vinyl halide in the presence of 0.1 to about 6 percent by weight of a trunk polymer consisting essentially of an aliphatic olefinic-acrylic ester copolymer, based upon the weight of said monomer to produce a polymer having a graft copolymer disperse phase of about 0.1 to about 0.5, micron particle diameter and having a particle size of 10 to 50 microns average grain size.

4,012,461
PROCESS FOR PREPARING POLYMER POWDERS

Robert A. van Brederode, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 6, 1975, Ser. No. 602,211
Int. Cl.² C08F *6/10, 255/02*; C08J *3/12*
U.S. Cl. 260—878 R **18 Claims**

1. A process for preparing powders of thermoplastic polymers comprising

dissolving 1 to 40 weight percent of thermoplastic polymer in a solvent of paraffin or cycloparaffin hydrocarbons having 5 to 12 carbon atoms at a temperature greater than 100° C up to about 165° C under autogenous conditions,

cooling said solution under autogenous conditions to a temperature less than 90° C,

subjecting said solution during said cooling to high shear agitation to produce particulate polymer, said high shear agitation being characterized by turbine agitators in a vessel being ⅓ to ⅔ the diameter of the vessel operated at from 20 to 300 rpm's and being rotated with 0.5 to 10 horse power per 1000 gallons of material agitated, short of emulsification to produce particulate polymer,

precipitating said thermoplastic polymer during said cooling and high shear agitation,

recovering a slurry of polymer particles and solvent,

atomizing said slurry into a vaporization zone, feeding a drying gas at a temperature in the range of 80 to 180° C into said vaporization zone and

recovering particulate polymer product having a substantial amount of said solvent removed therefrom.

4,012,462

HIGH IMPACT GRAFT COPOLYMERS

Sohan S. Chaudhary, Monroeville, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Filed May 15, 1975, Ser. No. 577,803
Int. Cl.² C08L 9/06
U.S. Cl. 260—880 R **7 Claims**

1. In a process for making graft copolymers comprising dissolving a rubbery copolymer selected from the group consisting of conjugated 1,3-diene rubbers, styrene-diene copolymer rubbers, acrylonitrile-diene copolymer rubbers, ethylene-propylene-diene terpolymer rubbers, acrylatediene copolymer rubbers, and mixtures thereof, in polymerizable ethylenically unsaturated monomer liquid selected from the group consisting of monovinylaromatic hydrocarbons, unsaturated nitriles, acrylic monomers, and mixtures thereof, to form a rubber solution, partially polymerizing said rubber solution in mass to form a prepolymer, subsequently suspending the prepolymer with additional monomer liquid in aqueous medium, and polymerizing the suspension to complete conversion to form a graft copolymer, the improvement for obtaining the prepolymer comprising:

a. polymerizing a first portion consisting of a 50 to 85 percent by weight of a total rubber solution by heating at a temperature of 70° to 130° C. in bulk to a conversion of 15 to 40 percent to form a prepolymer having an average rubber particle size of from 0.5 to 3.0 microns diameter; and

b. adding a second portion consisting of a 15 to 50 percent by weight of a total rubber solution to the prepolymer system and mixing at a lower temperature under conditions to form a prepolymer having an average rubber particle size of from 1.0 to 4.0 microns diameter with a maximum size of 5 to 15 microns diameter; said rubber particle size prepared in step (b) being greater than that prepared in step (a); whereby said prepolymer has a broad distribution of rubber particle sizes having a range of between 3.8 and 11 microns.

4,012,463

METHOD OF PREPARING STABLE CONDENSATION PRODUCTS USING A LEWIS ACID CATALYST AND PRODUCTS THEREOF

Edward N. Walsh, New City; Fred Jaffe, Ossining; Milton L. Honig, New York; Kyung S. Shim, Irvington, all of N.Y., and Mervin E. Brokke, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 473,471, May 18, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,840
Int. Cl.² C07F 9/08
U.S. Cl. 260—928 **14 Claims**

1. A process for forming a stabilized condensation product derived from condensing a β-haloalkyl ester of a pentavalent phosphorus acid with itself or with an alkyl ester of a pentavalent phosphorus acid to form a condensation product which comprises heating the condensation product which has been or is being treated with an alkylene oxide to remove acidity and labile groups therefrom with a catalytically effective amount of a Lewis acid at a temperature sufficient to promote neutralization of labile groups in said product.

12. A product formed by the process of claim 1.

4,012,464

S-(2-DIISOPROPYLAMINO-ETHYL)O-ETHYL METHYLPHOSPHONOTHIOATE STABILIZED WITH SOLUBLE CARBODIIMIDES

Lawrence C. Buckles, Kingsville, Md.; Stephen M. Lewis, deceased, late of Dugway Proving Ground, Utah, and Florence E. Lewis, heir, Long Beach, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 24, 1965, Ser. No. 491,074
Int. Cl.² C07F 9/165
U.S. Cl. 260—945 **7 Claims**

1. A composition consisting of S-(diisopropylamino ethyl-)O-ethyl methylphosphonothioate, and a stabilizing amount of a soluble carbodiimide selected from the group consisting of dicyclohexylcarbodiimide, diisopropylcarbodiimide, d-o-tolylcarbodiimide, bis(3-chloro-2-methyl-phenyl)carbodiimide, di(p-nitrophenyl)carbodiimide, di-p-tolylcarbodiimide, di(o-chlorophenyl)carbodiimide, di(o-methoxyphenyl)carbodiimide, and 1 cyclohexyl-3-(2-morpholinoethyl)carbodiimide.

4,012,465

ALKYL AND CYCLOALKYL METHYLPHOSPHONOFLUORIDOTHIOATES

Friedrick Wilhelm Hoffmann, and Ray Rei Irino, both of Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 13, 1962, Ser. No. 237,407
Int. Cl.² C07F 9/20
U.S. Cl. 260—958 **4 Claims**

1. A compound having the structure represented by the formula:

in which R is selected from the group consisting of alkyl groups of 1–5 carbon atoms and cycloalkyl groups of 6–9 carbon atoms.

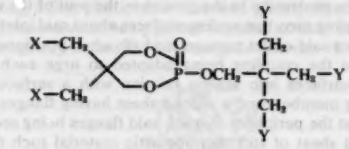
4,012,466

PRODUCTION OF 5,5-BIS(HALOMETHYL)-1,3,2-DIOXA-PHOSPHORINANES

Richard H. S. Wang, and James G. Pacifici, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,390
Int. Cl.² C07F 9/09
U.S. Cl. 260—974 **4 Claims**

1. Process for the preparation of 5,5-bis(halomethyl)-1,3,2-dioxa-phosphorinanes having the formula



wherein X is chloro or bromo, and each Y is the same or different and represents chloro or bromo, which comprises reacting at least about 1.5 mole proportions of dichloroneopentyl glycol or dibromoneopentyl glycol with one mole proportions of phosphorous oxychloride or phosphorous oxybromide in the presence of a hydrogen chloride accepting reagent at a temperature of from about 40° to about 180° C.

4,012,467

PROCESS FOR PREPARING AN ESTER OF THE N-METHYL-N-HYDROXYETHYLGUANIDINE

Elio Allievi, Via G. Macchi, 6, Cantu'(Como), Italy

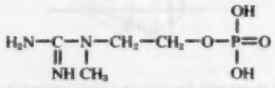
Filed Oct. 30, 1975, Ser. No. 627,378

Claims priority, application Italy, Nov. 13, 1974, 29373/74

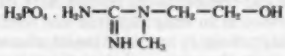
Int. Cl.² C07F 9/08

U.S. Cl. 260—978 **4 Claims**

1. Process for preparing the phosphoric ester of N-methyl-N-hydroxyethylguanidine of the formula



characterized in that the creatinol phosphate of the formula



is reacted with polyphosphoric acid in the molten state, under vacuum to eliminate the reaction water, and the obtained mass is poured into an organic solvent where the phosphoric ester of N-methyl-N-hydroxyethylguanidine is practically insoluble, whereas the rest of the reaction mixture is practically entirely soluble.

4,012,468

INNER VENTURI TUBE FOR CARBURETOR

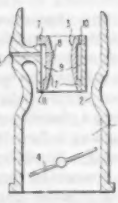
Kunio Kikuchi, Odawara, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1975, Ser. No. 626,893

Claims priority, application Japan, Oct. 31, 1974, 49-125922

Int. Cl.² F02M 7/02

U.S. Cl. 261—78 R **7 Claims**



1. An inner venturi for a venturi type fixed carburetor comprising: an outer core member having a main fuel passage extending through a wall thereof, an inner core member defining a fuel-air-mixture inner venturi passageway and having at least one main nozzle extending through a wall thereof and opening at one end thereof directly into said fuel-air-mixture venturi passageway, said inner core member being mounted within said outer core member and defining an elongated annular fuel well between the outer wall of said inner core member and the inner wall of said outer core member, said well extending substantially the fuel axial length of said core members, said at least one main nozzle opening into said fuel well, said inner and outer core members closing off said fuel well at the top and bottom thereof, and circumferentially spaced bleeder holes extending vertically through at least one of said core members at the top of said fuel well and small-diameter circumferentially spaced sub-nozzles extending vertically through at least one of said core members at the bottom thereof.

4,012,469

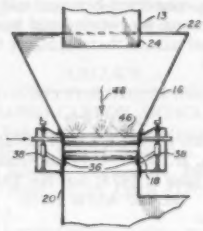
VENTURI WET SCRUBBER

Joseph Ittamar Accortt, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1975, Ser. No. 643,066

Int. Cl.² B01D 47/10

U.S. Cl. 261—117 **1 Claim**



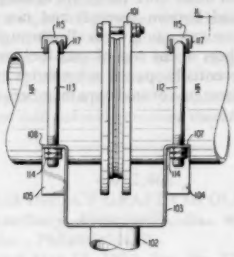
1. A venturi type scrubber comprising in combination a housing having an inlet region, a throat region and an outlet region, said housing being adapted to have a stream of contaminated gas pass downwardly therethrough entering said inlet region and then traversing said throat region and passing out of said outlet region, said inlet region having side walls that converge towards said throat region, a first tray of rod members of circular cross-section extending across said throat region with these members being in parallel spaced relation, a second tray of similar rod members spaced from said first tray in the direction of gas flow and with the rod members of the second tray being disposed generally intermediate those of the first, at least a plurality of the rod members of said first tray being hollow to provide a passageway therethrough, openings extending through the wall of said passageway in the upstream direction relative to said gas flow for conveying fluid from the interior of the said passageway into said gas flow counter-current thereto, at least some of said openings being disposed close to the venturi walls so that fluid passing therefrom will impinge upon said venturi walls upstream of said first tray, means for introducing a washing liquid into said passageways at one end thereof including a sump for said liquid and a pump to convey liquid from said sump to said passageway, conduit means to convey said liquid from the other end of said passageway to said sump and pressure regulator means in said conduit means to regulate the pressure in said passageway.

4,012,470

SEWAGE TREATMENT AERATION SYSTEMS

Paul M. Thayer, Milwaukee, Wis., assignor to Water Pollution Control Corporation, Milwaukee, Wis.

Continuation of Ser. No. 342,586, March 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 168,685, Aug. 3, 1971, Pat. No. 3,902,676. This application June 27, 1975, Ser. No. 591,259
Int. Cl.² B01F *3/04*
U.S. Cl. 261—122 9 Claims



1. In an aeration system including header means arranged in a tank on support means in generally horizontal relationship with diffusers spaced at longitudinal intervals along said header means, the improvement which comprises means to adjust the orientation of said diffusers with regard to said tank by rotating said header means, said improvement comprising:

first connecting means secured to the outer surface of said header means and integral therewith;

second connecting means on said support means; and

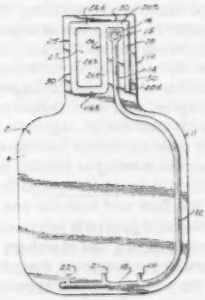
rotation means, connected between said first and second connecting means, for rotating said header means about its longitudinal axis to thereby adjust the orientation of said diffusers.

4,012,471

DISPOSABLE CONTAINER

George E. Kunkle, Jr., 4947 N. 113th, Omaha, Nebr. 68164

Filed June 6, 1975, Ser. No. 584,578
Int. Cl.² A61M *15/00*
U.S. Cl. 261—124 7 Claims



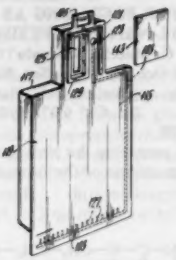
1. A container connectable to a coupling member having a groove formed in a wall of a recess in the coupling member, the container comprising: a first sheet of stiff thermoplastic material forming a first wall of the container, said first sheet having an inlet passage and an outlet passage extending therethrough; a protrusion on said first sheet, said protrusion extending exteriorly of the container and around the periphery of the outlet passage and about the inlet passage; a rib on said protrusion, said protrusion and said rib being of integral construction and being deformable to disengageably secure the rib on the protrusion in the groove in the wall of the recess in the coupling member; sealing surfaces about said inlet passage and about said outlet passage, said rib when positioned in the recess in the coupling being adapted to urge each of said sealing surfaces into sealing relation with a surface on the coupling member; and a second sheet having flanges extending about the periphery thereof, said flanges being secured to said first sheet of stiff thermoplastic material such that said second sheet forms a second wall of the container.

4,012,472

MEDICAL FLUIDS CONTAINER

Joseph W. Lindsey, Salt Lake City, Utah, assignor to Arbrook, Inc., Arlington, Tex.

Filed July 17, 1975, Ser. No. 596,791
Int. Cl.² A61M *15/00*
U.S. Cl. 261—124 28 Claims



1. A fluid reservoir for use in combination with a variety of medical devices including humidifier and nebulizer apparatus, comprising:

means for holding a quantity of fluid, said means having a flexible and collapsible configuration;

means formed as an integral part of said holding means for providing passage to an end of the interior of said holding means from the other end thereof, said passage means having a flexible and collapsible configuration;

means formed as an integral part of said holding means for providing access from without said holding means to said interior end passage means;

means formed as an integral part of said holding means for providing access directly from without said holding means to the interior of said holding means; and

means connected to said holding means for securing humidifier, nebulizer, and other housings to said holding means.

4,012,473

NEBULIZER-HUMIDIFIER

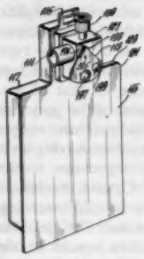
Joseph W. Lindsey, Salt Lake City, and Larry O. Murphy, Bountiful, both of Utah, assignors to Arbrook, Inc., Arlington, Tex.

Filed July 16, 1975, Ser. No. 596,556
Int. Cl.² A61M *15/00*
U.S. Cl. 261—142 18 Claims

1. A moisture contributing apparatus for medical oxygen breathing systems connectable intermediate an oxygen supply and a patient breathing apparatus, comprising:

a housing, connected to said oxygen supply and supportable thereby and connected to said patient breathing apparatus, said housing having a plurality of chambers including a first chamber containing a flow through heater, a second chamber containing a nozzle apparatus and an oxygen supply coupling connected thereto, a third exhaust chamber and a fourth transfer chamber, said third exhaust chamber including an air mix valve and an exhaust port, said air mix valve being operable to regulate an atmospheric portal into said third chamber;

a plastic bag suitable for holding a supply of water said bag having a first plastic side, a second plastic side, said first and second sides being joined together at their edges, and passageway means for accessing the interior of said bag,



said first side having a first and second openings therethrough and a mounting boss attached about said openings on the outside of said first side, said bag and said housing being attached together using said mounting boss.

4,012,474

METHOD FOR PRODUCING BORON CARBIDE SPHERULES

Harold G. Sowman, Maplewood, and James R. Johnson, White Bear Lake, both of Minn., assignors to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 295,825, July 17, 1963, abandoned, which is a division of Ser. No. 256,238, Feb. 15, 1963, Pat. No. 3,163,609, and Ser. No. 256,239, Feb. 5, 1963, abandoned, said Ser. No. 256,238, and Ser. No. 256,239, each is a division of Ser. No. 96,081, March 16, 1961, Pat. No. 3,129,188, which is a continuation-in-part of Ser. No. 838,445, Sept. 8, 1959, abandoned. This application Apr. 5, 1966, Ser. No. 540,197

Int. Cl.² B23C *23/00*

U.S. Cl. 264—15 4 Claims

1. The method for producing solid spherules of a crystalline boron carbide which comprises the transformation to spherical shape of small irregularly shaped discrete particles of a material of the group consisting of boron carbide and compounds of boron which react with carbon on heating to form boron carbide, said discrete particles being isolated from one another by an isolating medium characterized by low bulk density, resiliency, lack of undesirable reactivity and, when said small irregularly shaped particles are other than boron carbide, by the presence of at least a sufficient amount of carbon to produce boron carbide in addition to the isolating medium, by subjecting said particles in the isolating medium to rapid heating in a non-reactive atmosphere for a sufficient time and at a sufficient intensity to effect formation of boron carbide by reaction with carbon when the particles are other than a carbide and to bring about fusion of the discrete small particles in the isolating medium thereby subjecting said discrete molten particles to the action of surface tension forces inherent in said molten particles and rendering them substantially spherical, and cooling the resultant discrete spherular particles to solidify them.

4,012,475

METHOD FOR SECTIONING IN A MICROTOME AT LOW TEMPERATURE AND TRIMMING OF THE SPECIMEN TO BE SECTIONED

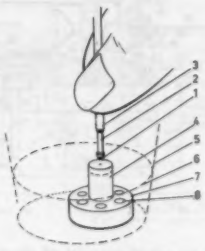
Erik Lennart Kindel, Bandhagen, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Aug. 23, 1974, Ser. No. 499,899

Claims priority, application Sweden, Aug. 28, 1973, 7311638

Int. Cl.² B29B *3/00*

U.S. Cl. 264—28 3 Claims



1. Method of preparing a specimen for sectioning by a microtome at low temperature comprising the steps of:

a. bringing a specimen into contact with a rod;

b. adhering the specimen to said rod;

c. manipulating the rod to convey the adhered specimen into contact with a cooled block, said block being provided with a recess having the shape desired to be imparted to said specimen;

d. and pressing at least a part of said specimen into said recess to freeze said part in said shape.

4,012,476

MOLDING PROCESS FOR THE MANUFACTURE OF SHAPED CARBON ARTICLES

Noriaki Mizuma, Tokyo, and Yukikazu Omura, Saitama, both of Japan, assignors to FMC Corporation, Philadelphia, Pa.

Filed July 3, 1972, Ser. No. 268,568

Int. Cl.² B29C *25/00*; C01B *31/02, 31/04*

U.S. Cl. 264—29.1 6 Claims

1. A method of forming shaped carbon products comprising forming a mixture consisting essentially of tar, pitch, finely-divided coke and microcrystalline cellulose in an amount sufficient to improve uniformity of distribution of the mixture under compression but less than 2.0% based on the weight of the combined tar, pitch and coke, and compressing the mixture into a shaped article.

4. The method of claim 1 wherein the shaped article is graphitized.

4,012,477

METHOD FOR PRODUCING PLASTIC SHEET OR FILM STOCK

Erich Beck, Worms, Germany; Albert C. Robbins, Alvin, and John C. Birdsall, Houston, both of Tex., assignors to Askco Engineering Corporation, Pasadena, Tex.

Division of Ser. No. 307,058, Nov. 16, 1972, Pat. No. 3,880,564. This application Apr. 11, 1975, Ser. No. 567,256

Int. Cl.² B29D *7/02*; B29F *3/00*

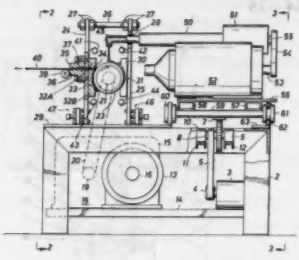
U.S. Cl. 264—176 R 14 Claims

1. A method of producing a thermoplastic sheet material using a single rotating roll extruder rotating in one direction longitudinally between first and second supporting members each having concave confining surfaces, comprising,

depositing a thermoplastic resin in a first substantially semi-circular chamber tapering in the direction of roll rotation and formed by the peripheral surface of said extruder roll and said concave surface of said first supporting member,

accumulating plasticized resin in said first chamber for creating a first pressure therein against said surface of said roll extruder and said first supporting member,

squeezing plasticized resin from said first chamber and into a second substantially semi-circular chamber formed by the peripheral surface of said extruder roll and said concave surface of said second supporting member and tapering in the direction of roll rotation into a slot-like extrusion orifice in said second supporting member,



accumulating an equal amount of plasticized resin in said second chamber for establishing and maintaining a second pressure therein against said surfaces of said roll extruder and said second supporting member equal to said first pressure, and

squeezing plasticized resin from said second chamber into said extrusion orifice in said second supporting member while maintaining balancing and opposing pressures in said chambers and on said extruder roll and allowing said roll to float between said chambers.

4,012,478

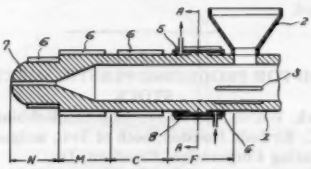
METHOD OF MAKING ANTI-FRICTION MEMBERS FROM LUBRICANT-IMPREGNATED POLYAMIDE SYNTHETIC RESIN MATERIALS

Masayuki Horikawa, Oiles Kogyo K.K. Kamataryo 1-28-5 Minami-Rokugo, Kamata, Tokyo; Yataro Takata, 5-402 Nihon Jutaku Kodan Takinoue-Danchi, 120 Takinoue, Naka, Yokohama, and Kikuo Sumiyoshi, Oiles Kogyo K.K. Benten Shataku 4-21-15 Sanno, Ohta, Tokyo, all of Japan

Continuation-in-part of Ser. No. 36,950, May 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 694,495, Dec. 29, 1967, abandoned. This application June 4, 1973, Ser. No. 366,426

Int. Cl.[2] B29B *1/10, 3/02;* **B29F** *3/02*

U.S. Cl. 264—211 **11 Claims**



1. A method of making bearings or other antifriction elements by plasticating a lubricant-contained polyamide comprising polyamide and about 2 – 12 wt. % of a mineral oil lubricant in relation to the total weight of the material uniformly dispersed therein which lubricant is in a liquid state at a normal room temperature, comprising the steps of uniformly mixing at room temperature a polyamide powder having a bulk factor of 2 – 5 so that an increased amount of lubricant may be added, said polyamide selected from the class consisting of nylon-6 having a melting point of from 215° to 220° C and an average molecular weight of about 45,000, nylon 6-6 having a melting point of about 255° C and an average molecular weight of about 45,000, nylon -11 having a melting point of from 184° to 185° C and an average molecular weight of about 40,000 and nylon -12 having a melting point of 175° to 177° C at an average molecular weight of about 45,000, molding the resultant molding composition to article form under heat and pressure by use of a screw type injection or extrusion molding machine, controlling the temperature of the feed section of the machine to that of about 50 – 75 % of the crystalline melting point of the polyamide, the temperature of said feed section of said machine ranges from 80° to 150° plus or minus 3° C, said machine having a compression section, the temperature in said compression section ranging from 175 to 225 plus or minus 3° C, said machine having a metering section, the temperature in said metering section ranging from 192° to 265° plus or minus 3° C, said machine having a nozzle section, the temperature in said nozzle section ranging from 190° to 230° plus or minus 3° C so that an article is provided in which the lubricant oil is uniformly dispersed.

4,012,479

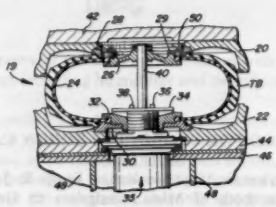
METHOD OF FORMING BELTED RADIAL TIRES FROM A CYLINDRICAL TIRE BAND

James Earl Britton, Akron; Joseph L. Grant, North Canton, and John Alan Welch, Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1975, Ser. No. 628,436

Int. Cl.[2] B29H *5/02, 17/14*

U.S. Cl. 264—315 **11 Claims**



1. A method of forming a belted radial tire from a cylindrical radial green tire band of the type having biased corded belts adapted to pantograph and expand circumferentially as the tire band is shaped to be molded into a finished tire without S-ing of the radial cords of the carcass plies under the belts of the finished tire as may be caused by the pantograph action of the belts while the tire band is being expanded into finished shape, the steps comprising:

1. lowering a belted radial green tire band of generally cylindrical shape into a conventional tire molding press over the inflatable curing bladder until the lower bead of the tire band is seated in the lower bead seat of the press, then applying inflation pressure into the curing bladder to a first pressure level while partially closing the press;
2. continuing to apply inflation pressure to a greater second pressure level while continuing to close the press wherein said belts pantograph and circumferentially expand primarily through partially closing the press and applying pressure up to said second pressure level until said tire band has reached a generally circular U-shape;
3. holding the pressure to said second pressure level while the press is in partially open position for a sufficient time interval to retain the belts in expanded position while the carcass cords under the belts stretch to be disposed at substantially 0° with respect to the tire axis;
4. lowering the pressure from said second pressure level to about the same as said first pressure level to permit ready closure of the press about said tire band; and
5. fully closing said press and applying higher molding pressure and temperature to cure the tire band into a finished tire as usual.

4,012,480
ISOTOPIC ENRICHMENT OF URANIUM WITH RESPECT TO AN ISOTOPE

Pierre Delvalle, Juvisy sur Orge, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 22, 1974, Ser. No. 444,932
Claims priority, application France, Feb. 27, 1973, 73.06881
Int. Cl.² C01G *43/00*
U.S. Cl. 423—10 **18 Claims**

1. A process for producing, from a source of uranium containing at least two isotopes, a product containing uranium enriched with respect to said source in one of said isotopes, comprising the steps

providing from said source uranium in valence state III and uranium in valence state IV, uranium in at least one of said valence states being provided in a liquid phase,

contacting for isotopic exchange said uranium III with said uranium IV, said contacting effectuating exchange of isotopes between uranium III and uranium IV to enrich the uranium IV in the lighter of said isotopes, and to enrich the uranium III in the heavier of said isotopes, while maintaining said uranium III free of contact with oxidizing conditions effective in oxidizing uranium III to uranium IV,

segregating the uranium IV resulting from said contacting from the uranium III resulting from said contacting.

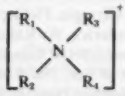
4,012,481
PROCESS FOR THE SEPARATION OF PLATINUM GROUP METALS

John Baltz, Lakewood, and Enzo Coltrinari, Arvada, both of Colo., assignors to PGP Industries, Inc., Sante Fe Springs, Calif.

Filed Nov. 7, 1975, Ser. No. 629,879
Int. Cl.² C01G *55/00*
U.S. Cl. 423—22 **13 Claims**

1. A process for the separation and selective recovery of Rhodium, and/or Ruthenium and Iridium values from an aqueous acidic medium which comprises:

contacting the medium with an organic extraction reagent comprising a water immiscible solvent having dissolved therein an organically substituted quaternary ammonium compound having the structure



wherein R_1, R_2, R_3 and R_4 are hydrocarbon groups, said compound being sufficiently soluble in said solvent to make a 1% solution and capable of forming complexes with Iridium and Ruthenium that are preferentially soluble in said solvent and whereby said contacting results in the formation of an organic extract phase and an aqueous raffinate phase,

maintaining said medium at an emf between about −500 and −1000 mv during said contacting operation,

separating said organic extract phase from said aqueous raffinate phase,

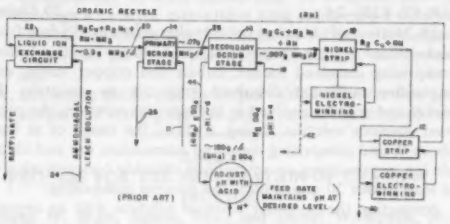
contacting said organic extract phase with at least the stoichiometric quantity of an aqueous alkaline stripping agent required for neutralization of the organic extract phase, said contact resulting in the formation of an aqueous phase loaded with Iridium and Ruthenium and a stripped organic phase, and

contacting said stripped organic phase and said loaded aqueous phase with a solution consisting of an acidified reducing agent which is at least the stoichiometric equivalent of said alkaline agent.

4,012,482
SCRUBBING OF AMMONIA FROM OXIME LIQUID ION EXCHANGE REAGENTS

David L. Natwig, Brighton, Mass., and Roald R. Skarbo, Lokken Verk, Norway, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed July 21, 1975, Ser. No. 597,550
Int. Cl.² C01G *3/00*, *51/00*, *53/00*
U.S. Cl. 423—24 **16 Claims**



1. A method for scrubbing extracted ammonia from metal bearing oximes in processes in which oximes are utilized to extract metals from ammoniacal leach liquors by solvent extraction comprising contacting the oxime to be scrubbed with an aqueous scrub solution containing a soluble metal that the oxime to be scrubbed can extract, the amount of the metal in the scrub solution being equivalent to the amount of ammonia to be scrubbed from the oxime, said contacting of the oxime with the scrub solution containing the metal eliminating the pH rise of the aqueous scrub liquor associated with acid scrubbing of ammonia from oximes into which ammonia has been extracted.

13. A method for recovering metals from metal acid bleed streams containing metal values by utilizing said bleed streams as an aqueous scrub solution to scrub ammonia from metal bearing oximes containing extracted ammonia in processes in which leached metals are recovered from ammoniacal leach liquors by solvent extraction with oximes comprising the following steps:

a. adjusting the pH of the bleed stream to serve as the aqueous scrub solution for the ammonia on the oxime to be scrubbed to a value at which the oxime to be scrubbed will extract metal values present in the bleed stream;

b. contacting the oximes with the acid bleed stream containing metal values which will replace the ammonia on the oxime; and,

c. maintaining the feed rate of the acid bleed stream so that the amount of extractable metal values and acid in the bleed stream is equivalent to the amount of ammonia to be scrubbed from the oxime,

said contacting of the oxime with the bleed stream scrubbing ammonia from the oxime and preventing the pH of the bleed stream scrub solution to drop to a value below which the oxime will not extract the metal from the bleed stream which replaces the ammonia on the oxime.

14. The method as set forth in claim 13 wherein the bleed stream contains a metal selected from the group consisting of nickel, cobalt and mixtures thereof and wherein said pH of the bleed stream to serve as the aqueous scrub solution for the ammonia is allowed to rise to a value of about 6.

4,012,483
SEPARATION OF COBALT FROM NICKEL IN AMMONIACAL SOLUTIONS USING 8-HYDROXYQUINOLINES

William S. Kane, Wicomic, and Paul H. Cardwell, Zanoni, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Continuation of Ser. No. 453,297, March 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 279,901, Aug. 11, 1972, abandoned, which is a continuation of Ser. No. 40,730, May 26, 1970, abandoned. This application Nov. 17, 1975, Ser. No. 632,201

Int. Cl.[2] C01G *51/00, 53/12, 3/00*

U.S. Cl. 423—24 **20 Claims**

18. Method of obtaining cobalt value substantially free from nickel value from a pregnant aqueous ammoniacal solution, comprising dissolved nickel, cobalt and copper value, and containing sufficient dissolved ammonia to maintain the nickel and cobalt dissolved in the aqueous solution, the pregnant aqueous solution having a pH in the range of at least about 9, and comprising dissolved ammonium ion and chloride ion, representing an ammonium chloride concentration of at least about 20 grams/liter, the process comprising:

contacting the pregnant aqueous solution with an organic liquid ion exchange medium comprising an ion exchange agent selected from the group consisting of 7-hydrocarbon-substituted-8-hydroxyquinolines while maintaining the aqueous solution at a pH of at least about 9, to form an organic extract phase containing the cobalt value and the copper value and an aqueous phase depleted in cobalt and copper value; separating the organic extract phase from the aqueous phase; contacting the organic extract phase with a weakly acid aqueous solution containing sufficient amount of hydrogen ions to selectively exchange the copper from the organic phase, to form an aqueous phase containing the copper value and an organic phase depleted in copper value; and separating the aqueous phase from the organic phase; whereby cobalt is obtained in the organic phase.

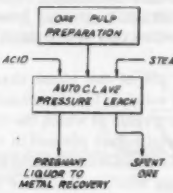
4,012,484
CHROMITE RECOVERY FROM CHROMITE-BEARING ORE

Guy W. Lussiez, Broomfield, Colo., assignor to Amax Inc., New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,423

Int. Cl.[2] C01G *37/14, 51/10, 53/10*

U.S. Cl. 423—53 **13 Claims**



3. A method of extracting chromium from nickel and cobalt-containing lateritic ore having a size fraction of over 20 microns and ranging up to about 3 mesh while extracting said nickel and cobalt which comprises,

mixing with said ore an amount of an oxidizing agent selected from the group consisting of Mn^{+4}, MnO_4^{-1} and $S_2O_8^{-2}$ at least stoichiometrically sufficient to oxidize chromium substantially to the hexavalent state,

forming an aqueous slurry of said ore mixture with an acid solution containing 10 to 30 normal sulfuric acid with an acid to ore ratio by weight of about 5:1 to 25:1,

and then subjecting said slurry to leaching at a temperature of about 150° C to 300° C and a pressure of about 70 psig to 1200 psig and thereby leach said chromium therefrom.

9. A method of extracting chromium from nickel and cobalt-containing lateritic ore while extracting said nickel and cobalt which comprises,

sizing said ore to provide a size fraction of fines below 20 microns in which substantial amounts of the chromium are acid-soluble in dilute sulfuric acid solution and also provide a coarse fraction falling within the range of over 20 microns and ranging up to about 3 mesh in which a substantial amount of chromium is insoluble in said dilute sulfuric acid,

mixing with said coarse fraction an amount of an oxidizing agent selected from the group consisting of Mn^{+4}, MnO_4^{-1} and $S_2O_8^{-2}$ at least stoichiometrically sufficient to oxidize chromium substantially to the hexavalent state,

forming an aqueous slurry of said coarse fraction mixture with an acid solution containing 10 to 30 normal sulfuric acid and having an acid to ore ratio by weight of at least 3:1,

subjecting said slurry to leaching at a temperature of about 150° C to 300° C at a pressure of about 70 psig to 1200 psig to leach said chromium therefrom, and form a pregnant solution containing said chromium and an insoluble residue,

separating said pregnant solution from said insoluble residue,

forming an aqueous pulp of said fines fraction,

mixing with said fines fraction an amount of an oxidizing agent selected from the group consisting of Mn^{+4}, MnO_4^{-1} and $S_2O_8^{-2}$ sufficient to oxidize chromium to substantially the hexavalent state,

mixing said pregnant solution with said fines fraction pulp to dilute the acid content thereof to not more than 10 normal and provide an acid to ore ratio in said fines fraction of about 0.1 to 0.5 by weight,

and then subjecting said pulp of fines fraction to pressure leaching at an elevated pressure and temperature to extract said soluble chromium from said fines fraction,

thereby producing a final pregnant solution containing substantially said chromium extracted from both the fines fraction and said coarse fraction.

4,012,485
PROCESS FOR TREATING EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE OVER CATALYST COMPRISING NICKEL, RHODIUM, AND MONOLITHIC CERAMIC SUPPORT

Garbis H. Meguerian, Olympia Fields; Eugene H. Hirschberg, Park Forest, and Frederick W. Rakowsky, Naperville, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 336,256, Feb. 27, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,353

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—213.5 **26 Claims**

1. A process for treating an exhaust gas from an internal combustion engine, which process comprises operating the engine under fuel-rich conditions so that the exhaust gas from the engine includes at least 0.8 volume percent carbon monoxide and the ratio of carbon monoxide to oxygen in the exhaust gas exceeds about 1; and passing the exhaust gas through a reduction zone maintained at a temperature of about 700° to about 1,800° F. so that nitrogen oxide gases in said exhaust gas react with the carbon monoxide and other reducing agents in said exhaust gas, said zone including a catalyst comprising a nickel component, a rhodium component, and a monolithic ceramic support for said nickel component and said rhodium component, said nickel component being present in an amount ranging from 2.5 to 12 wt.%, expressed as the metal and based on total catalyst weight, and comprising at least 75 wt.% of the total active metals present, and said rhodium component being present in an amount ranging from 0.01 to 0.8 wt.%, expressed as the metal and based on total catalyst weight, said catalyst being prepared by sequentially applying in the order specified hereinbelow to

said monolithic ceramic support first a solution containing a dissolved salt of nickel and second a solution containing a dissolved salt of rhodium, the application of each solution being followed by the removal of the diluent of that solution by drying to deposit on the support the salt of that solution and the calcination of the support with the salt of that solution thereon, said calcination being conducted in air at a temperature of about 1,000° to 1,500° F.

4,012,486
PROCESS FOR REDUCING THE TOTAL SULFUR CONTENT OF CLAUS OFF-GASES

David M. Singleton, Seabrook, Tex., assignor to Shell Development Company, Houston, Tex.

Filed July 2, 1975, Ser. No. 592,447
Int. Cl.² B01D *53/34*
U.S. Cl. 423—224 **11 Claims**

1. In a process for the oxidation of H_2S to SO_2 in a gaseous stream containing H_2S wherein the gaseous stream is contacted with a stoichiometric excess of oxygen with respect to the H_2S at a temperature of from 150° to 450° C in the presence of a catalyst, the improvement wherein the catalytically active component of the catalyst consists of Bi.

4,012,487
PROCESS FOR THE REMOVAL OF SO_2 FROM A STACK GAS

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Continuation-in-part of Ser. No. 346,772, April 2, 1973, which is a continuation-in-part of Ser. No. 86,364, Nov. 2, 1970, abandoned, and a continuation-in-part of Ser. No. 515,311, Oct. 16, 1974, abandoned, which is a continuation of Ser. No. 238,290, March 27, 1972, abandoned. This application July 22, 1975, Ser. No. 598,170
Int. Cl.² C01B *17/00, 17/72;* **C09K** *3/00*
U.S. Cl. 423—242 **29 Claims**

1. A process for removing SO_2 from an SO_2-containing gas which comprises:

contacting said SO_2-containing gas, in an absorption zone, with a liquid absorptive medium, to thereby absorb the SO_2 of said SO_2-containing gas and produce an SO_2 enriched absorptive medium, said liquid absorptive medium being prepared by contacting, in an aqueous medium:

a. activated aluminum comprising aluminum metal which has been permeated with a second metal selected from:
   i. mercury;
   ii. indium;
   iii. gallium; and
   iv. indium/gallium alloys; and
b. A source of SO_2, whereby the aluminum of said activated aluminum erodes in said aqueous medium and reacts with the SO_2 of said source of SO_2 and hydrogen atoms liberated from the aqueous medium by said activated aluminum, to thereby from said absorptive medium.

4,012,488
PROCESS FOR THE TREATMENT OF SULFUR AND NITROGEN OXIDES FORMED DURING POWER GENERATION

Jack Brocoff, Fullerton, Calif., assignor to Ralph M. Parsons Company, Pasadena, Calif.

Filed Mar. 13, 1974, Ser. No. 450,550
Int. Cl.² C01B *17/00, 17/16, 21/00;* **F23J** *7/00*
U.S. Cl. 423—244 **15 Claims**

1. A process for elimination of at least the oxides of sulfur and the oxides of nitrogen from flue gases formed in the combustion zone of the boiler of power generating apparatus which consumes sulfur bearing fossil fuels which comprises:

a. combusting the sulfur bearing fossil fuel in the combustion zone in presence of excess air to form a high temperature flue gas containing oxides of carbon, oxides of sulfur, oxides of nitrogen, water and uncombined oxygen;
b. combining an atomized hydrocarbon fuel with the high temperature flue gas to generate a hydrogen containing reducing gas in an amount at least sufficient to consume substantially all of the uncombined oxygen contained in the high temperature flue gas;
c. cooling the high temperature flue gas in said boiler to extract heat values therefrom;
d. catalytically converting at least the contained oxides of sulfur to hydrogen sulfide and the oxides of nitrogen to a nitrogen compound selected from the group consisting of nitrogen, ammonia and mixtures thereof by passing the cooled flue gas and a hydrogen containing reducing gas at temperatures of from about 300° F, to about 800° F through a catalytic conversion zone containing a catalyst capable of converting the oxides of sulfur to hydrogen sulfide and the oxides of nitrogen to nitrogen and ammonia;
e. extracting the formed hydrogen sulfide from the flue gas stream and venting the flue gas stream to the atmosphere.

4,012,489
PROCESS FOR THE PREPARATION OF URANIUM DIOXIDE

George W. Watt, Austin, Tex., and Daniel W. Baugh, Jr., Baton Rouge, La., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed May 21, 1975, Ser. No. 579,494
Int. Cl.² C01G *43/02*
U.S. Cl. 423—261 **16 Claims**

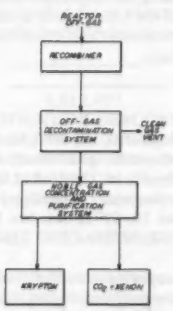
1. A process for the preparation of an actinide dioxide comprising the steps of:

a. reacting an actinide nitrate hexahydrate selected from the group consisting of uranyl nitrate hexahydrate, plutonyl nitrate hexahydrate and neptunyl nitrate hexahydrate with sodium dithionite to yield a sulfite containing reaction product of the corresponding actinide; and
b. heating the reaction product resulting from step (a) in the absence of an oxygen-containing atmosphere to obtain the actinide dioxide.

4,012,490
REMOVING RADIOACTIVE NOBLE GASES FROM NUCLEAR PROCESS OFF-GASES

Antony Lofredo, Springfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 275,017, July 25, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,657
Int. Cl.² C01B *23/00;* **F25J** *3/00;* **G21F** *9/02*
U.S. Cl. 423—262 **19 Claims**



19. In a process for removing radioactive krypton and xenon from a gaseous feed stream that consists mainly of air and radiolytic hydrogen and oxygen, the method which comprises:

a. initially removing radiolytic oxygen by catalytic reaction from the feed stream;

b. directing the stream containing atmospheric oxygen and nitrogen through adsorber means for removing xenon and carbon dioxide therefrom;
c. feeding the remainder of the stream including hydrogen, radioactive krypton and atmospheric oxygen and nitrogen to a first cryogenic distillation column for separating and liquefying the krypton and oxygen;
d. combining said separated oxygen with hydrogen to form water and subsequently removing said water;
e. feeding the separated krypton to a second cryogenic distillation column for concentrating the krypton therein;
f. returning the effluent gas from the second column to the inlet of the first column for concentrating all the krypton within a closed loop;
g. collecting the concentrated krypton from the second column for storage;
h. eluting the xenon together with the carbon dioxide from the adsorber means by distillation effluent gas from one of said columns and separating the xenon and carbon dioxide from the effluent for storage, and
i. returning the eluted gas to be reprocessed to prevent loss of radioactive gas.

4,012,491

PHOSPHATE PROCESS

Douglas Oliver Hauge, Lafayette, Calif., assignor to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 190,511, Oct. 19, 1971, Pat. No. 3,919,395, which is a continuation-in-part of Ser. No. 90,542, Nov. 18, 1970, abandoned. This application Oct. 25, 1974, Ser. No. 518,128

Int. Cl.² C01B *15/16, 25/26, 25/16*

U.S. Cl. 423—309 **13 Claims**

1. A process for the recovery of phosphate values by chemical leaching from a phosphatic-mineral-containing souce material comprising the steps of:
1. forming an aqueous leach acid mixture of sulfuric acid and a second acid selected from the group essentially consisting of hydrochloric acid and nitric acid, in approximate proportions of about ¾ mole of the second acid, about 1⅛ mole sulfuric acid and about 52½ moles water;
2. mixing the leach acid with crushed phosphatic-mineral-containing source in approximate proportions on the order of about 13.7–16.7 tons leach acid per ton of P_2O_5 in the phosphorus-mineral-containing source;
3. withdrawing a phosphoric acid leach liquor containing about 5–7% P_2O_5;
4. in a step-wise precipitation and concentration; raising the pH of the leach liquor to about 2–3 to precipitate impurities, and separating the impurities precipitated; and then raising the pH of the leach liquor to about 3–5 to precipitate calcium phosphate, and separating the precipitated calcium phosphate.

4,012,492

SYNTHESIS OF ANHYDROUS METAL PERCHLORATES

Carl J. Schack, Chatsworth, and Donald Pilipovich, Agoura, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,549

Int. Cl.² C01B *7/02, 11/00;* **C01G** *23/00, 37/00, 31/00*

U.S. Cl. 423—472 **5 Claims**

1. A method of preparing an anhydrous metal perchlorate which comprises admixing for at least 4 hours at a temperature from −45° C to 20° C an anhydrous metal chloride selected from the class consisting of titanium tetrachloride, chromyl chloride, and vanadium oxytrichloride with chlorine perchlorate in a metal chloride-to-chlorine perchlorate mole ratio which is 1:4 if titanium tetrachloride is selected, or is 1:2 if chromyl chloride is selected, or is 1:3 if vanadium oxytrichloride is selected, and recovering said anhydrous metal perchlorate.

4,012,493

PREPARATION OF METAL FLUORIDES

Gilbert S. Layne, and James O. Huml, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 000,445, Jan. 2, 1970, abandoned. This application June 23, 1972, Ser. No. 265,781

Int. Cl.² C01B *9/08;* **C01F** *5/28;* **C22B** *5/02;* **C01B** *31/18*

U.S. Cl. 423—489 **12 Claims**

1. A process for simultaneously preparing metal and metal fluoride products which comprises:
a. reacting in a reaction zone a molten mixture containing at least one metal oxide, at least one metal fluorinating agent selected from the group consisting of a fluoride of iron, lead or copper, and carbon, said reactants provided in an amount to establish a fluoride atom to oxygen atom ratio of the reactants ranging from about 0.1 to less than 2 times the valence of the cation of the metal fluorinating agent to produce a metal fluoride product containing the cation of the metal oxide reactant, elemental metal from the cation of said fluorinating agent, and a gaseous oxide of carbon, said fluorinating agent having a Gibbs Free Energy computed on an equivalent fluoride basis which is greater than the Gibbs Free Energy of the metal fluoride product, and
b. separating said reaction products from each other.

4,012,494

DIRECT RADIOIMMUNOASSAY FOR ANTIGENS AND THEIR ANTIBODIES

Chung-Mei Ling, Highland Park, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 210,510, Dec. 21, 1971, Pat. No. 3,867,517. This application June 17, 1974, Ser. No. 480,180

Int. Cl.² G01N *33/00, 33/16;* **G21H** *5/02*

U.S. Cl. 424—1 **11 Claims**

1. A method for determining the presence of a hepatitis associated antigen or its antibody in an unknown sample utilizing direct radioimmunoassay comprising:
a. forming a solution of a hepatitis associated antigen or antibody;
b. affixing the antigen or antibody contained in said solution to a test apparatus;
c. incubating said test apparatus to affix said antigen or antibody to said test apparatus as a first layer;
d. washing said incubated affixed test apparatus to remove any unaffixed antigen or antibody;
e. placing said unknown sample in contact with said incubated and washed test apparatus;
f. including said unknown sample while in contact with said washed test apparatus to bond any of said antibody or antigen present in said unknown sample as a second layer to said antigen or antibody layer on said test apparatus, respectively;
g. washing said incubated test apparatus to remove any unbound antibody or antigen in said unknown sample;
h. contacting said washed test apparatus with said antigen or antibody labeled with a radioactive isotope;
i. incubating said washed test apparatus while in contact with said antigen or antibody labeled with a radioactive isotope so as to bond said radioactive form of said unknown antibody or antigen, respectively, bonded on said test apparatus and thereby produce a radioactively traced incubated coating as a third layer;
j. washing said radioactively traced incubated coating to remove any unbonded radioactively-labeled antigen or antibody;
k. placing a control sample in contact with another incubated and washed test apparatus also prepared according to steps (a) through (d);
l. incubating said control sample while in contact with said coated test apparatus to bond any of said antibody or antigen present in said control sample as a second layer to

said antibody or antigen layer on said test apparatus, respectively;

m. washing said incubated test control apparatus to remove any unbonded antibody or antigen in said control sample;

n. contacting said washed test control apparatus with a form of said antigen or antibody labeled with a radioactive isotope;

o. incubating said washed test control apparatus while in contact with said form of said antigen or antibody labeled with a radioactive isotope so as to bond said radioactive form to said coated antibody or antigen, respectively, bonded on said test apparatus and thereby produce a radioactivity traced incubated coating as a third layer;

p. washing said radioactively traced incubated coating to remove any unbonded radioactively-labeled antigen or antibody;

q. counting radiation emitted from said radioactively traced incubation coating of step (j); and

r. comparing the number of counts from said coating of step (j) with the number of counts from the control sample prepared by steps (k) to (p).

4,012,495
4-(POLYALKOXYPHENYL)-2-PYRROLIDONES

Ralph Schmiechen; Reinhard Horowski; Dieter Palenschat; Gert Paschelke; Helmut Wachtel, and Wolfgang Kehr, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

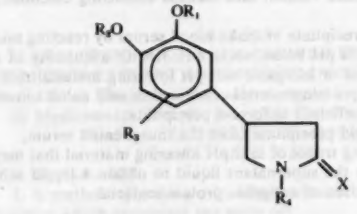
Filed Mar. 20, 1975, Ser. No. 560,193

Claims priority, application Germany, Mar. 20, 1974, 2413935

Int. Cl. A61k *31/40*

U.S. Cl. 424—274 **58 Claims**

1. A pharamaceutical composition for the treatment of neurological and psychic disorders responsive to chlorpromazine therapy and characterized by one or more of the symptoms of anxiety, hostility, aggression, withdrawal, hallucination, thought-disturbances, delusion and agitation, comprising, in admixture with a pharmaceutically acceptable carrier, an amount per dosage unit from 0.05–20 mg. effective to reduce the symptoms of such disorders, of a 4-(polyalkoxyphenyl)-2-pyrrolidone of the formula



wherein R_1 and R_2 each are hydrocarbon of up to 18 carbon atoms or alkyl of 1–5 carbon atoms substituted by one or more halogen atoms or by one hydroxy, carboxy, alkoxy of 1–5 carbon atoms, alkoxycarbonyl of 1–5 carbon atoms in the alkoxy group, carboxamido, alkylcarboxamido, dialkylcarboxamido, carboxycyclicamido, amino, alkylamino, dialkyl or alkyleneimino, wherein alkyl in each instance is of 1–5 carbon atoms and wherein the nitrogen atom of the cyclicamido and alkyleneimino groups is a ring member of alkyleneimino of 4 to 7 members or R_1 or R_2 collectively are alkylene of 1–3 carbon atoms; R_3 is a hydrogen atom or methoxy; R_4 is a hydrogen atom, alkyl of 1–5 carbon atoms, phenyl, naphthyl, tolyl, xylyl or alkanoyl of 1–6 carbon atoms; and X is an oxygen atom or a sulfur atom.

4,012,496
VAGINAL RING

Gisela Schöpflin; Gerhard Laudahn; Barbara Mühe; Heidemarie Hartmann, and Fred Windt, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Oct. 17, 1975, Ser. No. 623,487

Claims priority, application Germany, Oct. 18, 1974, 2450107; Aug. 21, 1975, 2537585

Int. Cl.² A61K *9/00*

U.S. Cl. 424—15 **13 Claims**

1. A composite vaginal ring containing a safe and effective amount of a pharmaceutically active medicament, consisting essentially of:

a. a supporting, medicament-free vaginal ring consisting essentially of a physiologically acceptable synthetic resin selected from the group consisting of organopolysiloxane elastomers, polyamides, natural and synthetic rubber, polyesters, polytetrafluoroethylene and polyethylenes and having a continuous encircling pocket-like indentation along the outer edge of the annular surface along the central plane thereof adapted to mate with a corresponding smaller, medicament-containing outer encircling annular vaginal ring segment; and

b. a smaller, vaginal medicament-containing outer encircling annular vaginal ring adapted to mate with the continuous encircling pocket-like indentation in the modified annular surface of said supporting, medicament-free vaginal ring along the central plane thereof and consisting essentially of a safe and effective amount of a pharmaceutically active nonionic, lipophilic vaginal drug dissolved or uniformly suspended in as elastomeric, cross-linked LTV linear dimethylpolysiloxane resin.

4,012,497
DRUG EXCIPIENT OF SILICONE RUBBER

Gisela Schopflin, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Sept. 23, 1975, Ser. No. 616,001

Claims priority, application Germany, Sept. 24, 1974, 2445971

Int. Cl.² A61K *9/00*

U.S. Cl. 424—22 **9 Claims**

1. A non-toxic sustained release pharmaceutical composition in the form of a shaped object having a Shore A hardness of 45–70, consisting essentially of a safe and pharmaceutically active amount of a nonionic lipophilic drug having a dissociation constant of less than 10^{-7} and which is olefinically or acetylenically unsaturated and soluble in ether, chloroform or benzene, said drug being dissolved or uniformly suspended in a non-toxic vulcanized LTV linear dimethylpolysiloxane elastomer and said composition being prepared by reacting, at an elevated temperature and in contact with a catalytic amount

of a platinum-based vulcanization catalyst capable of catalyzing the reaction between silicon-linked hydrogen residues and silicon-linked vinyl residues a mixture of said drug and a vulcanizable composition consisting essentially of:

a. a polydimethylsiloxane having vinyl groups on both ends;

b. a copolymer consisting essentially of SiO_2 units, $(CH_3)_3SiO_{0.5}$ units, Vinyl $(CH_3)_2SiO_{0.5}$ units; and

c. a cross-linking Si-H component, consisting essentially of $(CH_3)_3SiO_{0.5}$ units, $(CH_3)_2SiO$ units and CH_3HSiO units.

4,012,498
SUSTAINED RELEASE TABLET FORMULATIONS

Saul S. Kornblum, Springfield, and Samuel B. Stoopak, West Caldwell, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 455,185, March 27, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 655,838

Int. Cl.² A61K *9/22, 9/26*

U.S. Cl. 424—22 **12 Claims**

1. A three component sustained release medicament formulation comprising;

a first component comprising phenobarbital and belladonna levoratory alkaloids incorporated into an immediate release portion;

a second component comprising belladonna levoratory alkaloids incorporated into a separate basic pH affected controlled release matrix; with phenobarbital, microcrystalline cellulose, and calcium sulfate also incorporated into a separate control release vinyl acetate-vinyl alcohol copolymer resin matrix; and

a third component comprising phenobarbital and belladonna levoratory alkaloids each incorporated into a separate control release vinyl acetate-vinyl alcohol copolymer resin matrix.

4,012,499
CYCLIC SULPHUR COMPOUNDS

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Raleigh, N.C.

Continuation-in-part of Ser. No. 361,523, May 18, 1973, Pat. No. 3,905,989. This application June 12, 1975, Ser. No. 586,426

Claims priority, application United Kingdom, May 19, 1972, 23805/72; Sept. 6, 1972, 41429/72; May 4, 1973, 21174/73

Int. Cl.² A61K *9/14, 31/41*

U.S. Cl. 424—46 **27 Claims**

1. A method for the treatment or prophylaxis of an allergic condition of a mammal comprising administration to the mammal of a therapeutically or prophylactically effective anti-allergic dose of a tricyclic compound selected from 3-(5-tetrazolyl) thioxanthone-10,10-dioxide, and pharmaceutically acceptable salt of said compound.

4,012,500
METHOD AND COMPOSITION TO INHIBIT SYMPTOMS OF ALLERGY

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

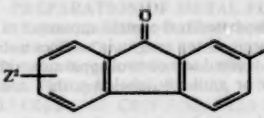
Division of Ser. No. 394,423, Sept. 5, 1973, Pat. No. 3,939,173. This application Nov. 24, 1975, Ser. No. 634,450

Claims priority, application United Kingdom, Sept. 6, 1972, 41431/72; Feb. 20, 1973, 8200/73

Int. Cl.² A61K *9/14, 31/41*

U.S. Cl. 424—46 **30 Claims**

1. A method of inhibiting the symptoms of asthma or allergic rhinitis in a mammal susceptible to asthma or allergic rhinitis, which comprises administering to said mammal a prophylactically effective non toxic amount of a compound of formula (I)



(I)

wherein Z^1 and Z^2 are each a 5-(1-R)tetrazolyl or a 5-(2-R) tetrazolyl in which R is hydrogen or alkyl having 1 to 6 carbon atoms or a pharmaceutically acceptable salt of said compound.

4,012,501
HAIR-CARE COMPOSITION CONTAINING A THERMOPLASTIC POLYMER

Elliott Farber, St. Louis Park, Minn., assignor to La Maur Inc., Minneapolis, Minn.

Filed May 8, 1975, Ser. No. 575,653

Int. Cl.² A61K *7/11*

U.S. Cl. 424—47 **23 Claims**

1. In a hair-care composition comprising an ethanolic cosmetic vehicle and between about 1 and 20% by weight, based on the total weight of said composition, of film-forming thermoplastic resinous polymeric material distributed in said vehicle, the improvement wherein said polymeric material in dried condition is resistant to softening by humidity, is insoluble in water alone but is dispersible in water having a cosmetic pH, from an acid pH through an alkaline pH, is soluble in ethanol, and consists essentially of the addition free-radical polymerization product of, by weight percent: 1 to 20% of 1,1 dimethyl-1,(2-hydroxypropyl) amine methacrylimide; 8 to 45% of N-vinyl pyrrolidone; and 35 to 89% of vinyl acetate.

4,012,502
SNAKE VENOM INHIBITOR MATERIAL AND METHOD OF PURIFICATION

Van B. Philpot, Jr., P.O. Box 312, Houston, Miss. 38851

Continuation-in-part of Ser. No. 399,469, Sept. 21, 1973, abandoned, which is a continuation of Ser. No. 239,327, March 29, 1972, abandoned. This application Apr. 10, 1975, Ser. No. 566,995

Int. Cl.² A61K *35/14, 35/58*

U.S. Cl. 424—98 **8 Claims**

1. A method of purifying snake blood serum to obtain an inhibitor of snake venom, said method consisting essentially of,

forming a precipitate in snake blood serum by reacting said serum, at a pH below about pH 3, with a quantity of a strong acid or inorganic salt pH lowering material reactive with protein material contained in said extract in an amount sufficient to form a precipitate,

removing said precipitate from the thus treated serum,

and removing traces of said pH lowering material that may remain in the supernatant liquid to obtain a liquid substantially free of antigenic protein material.

4,012,503
COATING COMPOSITIONS USED TO CONTROL BARNACLES

Aaron Freiman, Brooklyn, N.Y., assignor to M & T Chemicals Inc., Greenwich, Conn.

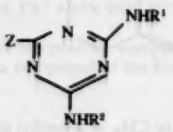
Continuation-in-part of Ser. No. 355,403, April 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 142,041, May 10, 1971, abandoned. This application June 11, 1975, Ser. No. 586,074

Int. Cl.² A01N *11/00*

U.S. Cl. 424—145 **2 Claims**

1. A coating composition for inhibiting the development of barnacles on substrates exposed to a marine environment, said composition comprising 1) a carrier which in turn comprises

rosin and a film-forming vinyl polymer, 2) at least one pigment, 3) at least one organic liquid for dissolving and dispersing the solid components of said composition, and 4) an effective amount of toxicant composition consisting essentially of between 10 and 15%, based on the total weight of said composition, of tri-n-butyltin fluoride, between 5 and 10% by weight of zinc oxide and between 3 and 10% by weight of a triazine



selected from the group consisting of 2-ethylamino-4-isopropylamino-6-methylthio-s-triazine and 2-chloro-4-ethylamino-6-isopropylamino-s-triazine.

4,012,504
IODINE MINERAL OIL SOLUTION FOR PREVENTING BOVINE MASTITIS

Clyde S. Eckols, Kenedy, Tex., assignor to Velvet Chemical Co., Kenedy, Tex.

Continuation-in-part of Ser. No. 252,746, May 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 194,007, Oct. 29, 1971, abandoned. This application June 30, 1975, Ser. No. 591,940
Int. Cl.² A61K *33/18*
U.S. Cl. 424—150 **16 Claims**

1. A process for treating cows to control the spread of bovine mastitis, prevent chapping and chafing of cow teats and aid the healing of teat cuts and abrasions comprising applying to the cow teats a composition consisting essentially of mineral oil containing 0.2 to 7% by weight iodine dissolved therein.

9. A teat dip for controlling the spread of bovine mastitis consisting essentially of mineral oil, about 0.2 to 7% by weight iodine dissolved in said oil, not less than 2 grams per gallon teat dip of polyoxyethylene cetyl ether, and at least sufficient water to dissolve said polyoxyethylene cetyl ether.

4,012,505
ANALGESIC SUBSTANCE DERIVED FROM THE HELLEBORUS PLANT AND METHOD OF MAKING SAME

Vasile Boici, Timisoara, Romania, assignor to Intreprinderea de Medicamente Terapia, Romania, Cluj-Napoca, Romania

Filed Nov. 26, 1975, Ser. No. 635,636
Int. Cl.² A61K *35/78*
U.S. Cl. 424—195 **3 Claims**

1. A method of making a locally applicable analgesic composition which comprises the steps of:

a. extracting stems and roots of the Helleborus species of one Ranunculaceae genus with alcohol in a ratio of the part of the plant material to 2–3 parts of the alcohol at about room temperature to form a raw extract;

b. treating said raw extract with concentrated hydrochloric acid in a ratio of one part of the acid to 10 parts of the extract, thereby forming a precipitate therein;

c. decoloring the filtrate resulting from the separation of the liquid from the precipitate formed in step (b) with active carbon and neutralizing the decolored filtrate to a pH of about 6.5 to 7 with about 10% sodium hydroxide; and

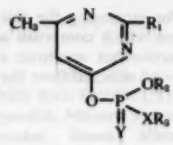
d. diluting the solution formed in step (c) with distilled water to bring the sodium chloride concentration thereof to a substantially isotonic concentration, thereby consituting of said solution, said composition.

4,012,506
PYRIMIDYL THIO- AND DITHIO-PHOSPHORIC ACID ESTERS

David E. Balke, Mobile, Ala., and Ward H. Oliver, La Place, La., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 3, 1975, Ser. No. 593,144
Int. Cl.² C07F *9/65;* **A01N** *9/36*
U.S. Cl. 424—200 **12 Claims**

1. A compound of the formula



wherein

R_1 represents a C_3 to C_6 cycloalkyl group,

R_2 and R_3 each represents a C_1 to C_3 alkyl group, and

X and Y each represent oxygen or sulfur.

4,012,507
VAPOR PHASE PROCESS TO IMPART SMOLDER RESISTANCE TO COTTON BATTING AND OTHER CELLULOSIC MATERIALS

Nestor B. Knoepfler; John P. Madacsi, both of New Orleans, and Julius P. Neumeyer, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1975, Ser. No. 555,487
Int. Cl.² C09K *3/28;* **C23C** *13/04*
U.S. Cl. 427—212 **4 Claims**

1. A process for imparting smolder resistance to a cellulosic material which process comprises contacting a cellulosic material having a water content of at least 0.1 percent with vapors of a system which consists of methanol, boric acid, methyl borate, and water having a boiling point of about 68° C and which reacts with the water present in the cellulosic substrate to form boric acid, maintaining the cellulosic material and vapors in contact between 1 and 120 minutes and temperatures at which the contact is conducted being maintained between 18° and 71° C so that the cellulosic material is rendered smolder resistant.

4,012,508
TOPICAL COMPOSITION AND METHOD

Verna M. Burton, 1223 Lincoln Road, Rte. 7, Allegan, Mich. 49010

Filed Feb. 3, 1975, Ser. No. 546,813
Int. Cl.² A61K *31/605, 31/56*
U.S. Cl. 424—235 **18 Claims**

1. A composition for topical use in treatment of corns, warts, and athlete's foot, the composition comprising an effective amount of a cortical steroid intimately mixed with an effective amount of aspirin, and a carrier of oils, creams or jellies, wherein the relative proportion of aspirin is substantially greater than the portion of the cortical steroid in the composition.

4,012,509
COMPOSITION OF MATTER AND PROCESS

Fred R. Frank, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

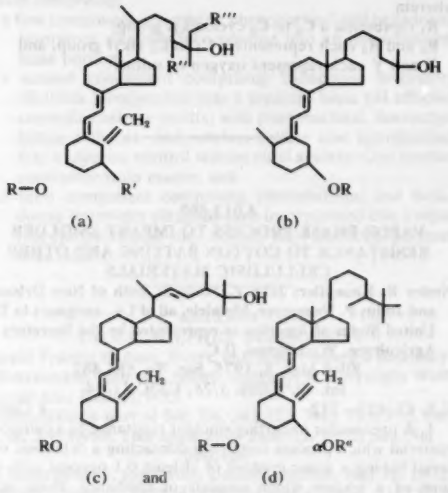
Continuation of Ser. No. 477,765, June 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 218,480, Jan. 17, 1972, Pat. No. 3,823,237, which is a continuation-in-part of Ser. No. 210,232, Dec. 20, 1971, abandoned. This application July 3, 1975, Ser. No. 592,821

The portion of the term of this patent subsequent to July 9, 1991, has been disclaimed.

Int. Cl.[2] A61K *31/59*

U.S. Cl. 424—236 **6 Claims**

1. The method for increasing the thickness of egg shells from egg-laying hens which comprises administering to the laying hens an effective but non-toxic egg shell thickening amount of a compound selected from the group consisting of



where R=H or acyl where acyl is an acyl radical of normal or isomerized alkane carboxylic acid of from 2 to about 8 carbon atoms, inclusive, and R', R'', and R''' are hydrogen, hydroxyl or O-acyl wherein acyl is defined as above with the proviso that at least two of R', R'' and R''' must be hydrogen and that if R',R'' or R''' is hydroxyl, then R must be hydrogen and when R', R'' or R''' is O acyl, acyl defined as above, then R must be the same acyl, and R[e] is hydrogen or acyl, acyl as defined above, and when R[e] is hydrogen, R is hydrogen, and when R[e] is acyl, as defined above, R is the same acyl.

4,012,510
NOVEL METHYLENE STEROIDS

Rudolf Wiechert; Klaus Kieslich, and Henning Koch, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

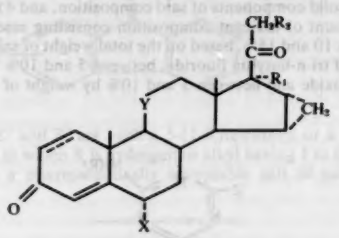
Filed Nov. 10, 1975, Ser. No. 630,627

Claims priority, application Germany, Nov. 11, 1974, 2453823

Int. Cl.[2] A61K *31/56*

U.S. Cl. 424—243 **24 Claims**

1. A methylene steroid of the formula



wherein X is H, F or CH_3, or a methyl group; Y is β-hydroxymethylene or carbonyl; one of R_1 and R_2 is a hydrogen atom and, when R_2 is a hydrogen atom, R_1 is hydroxy or alkanoyloxy of 1 to 8 carbon atoms and, when R_1 is a hydrogen atom, R_2 is hydroxy or acyloxy, wherein acyl is the acyl radical of sulfuric or phosphoric acid or a physiologically acceptable carboxylic acid of 1–12 carbon atoms.

20. A pharmaceutical composition comprising an anti-inflammatorily effective concentration of at least one methylene steroid of claim 1 in admixture with a pharmaceutically acceptable carrier adapted for topical administration.

4,012,511
OXAZINOINDOLE DERIVATIVES USEFUL AS ANTIDEPRESSANTS

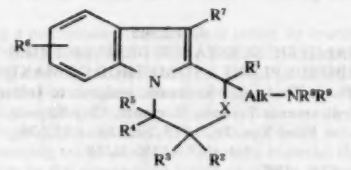
Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux; George Santroch, Montreal; Thomas A. Dobson, Dollard des Ormeaux, and Ivo Jirkovsky, Montreal, all of Canada, assignors to Ayerst McKenna & Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 473,646, May 28, 1974, Pat. No. 3,962,236, and Ser. No. 226,287, Feb. 14, 1972, Pat. No. 3,833,575. This application July 7, 1975, Ser. No. 593,582

Int. Cl.[2] A01N *9/00, 9/22;* **C07D** *265/00, 273/00*

U.S. Cl. 424—248.4 **31 Claims**

1. A compound of formula



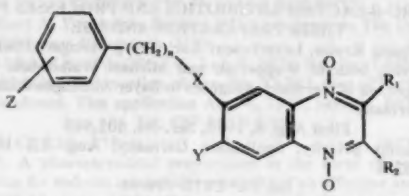
in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo, R^7 is lower alkyl; X is oxy; and Alk—NR^8R^9 is an amino(lower)alkyl radical in which Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ in which R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl, and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholine, piperazino, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl.

4,012,512
ANIMAL FEEDS CONTAINING QUINOXALINE-DI-N-OXIDE DERIVATIVES

Peter J. Diel, Basel, and Wolfgang Schmid, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 393,863, Sept. 4, 1973, Pat. No. 3,900,473. This application May 27, 1975, **Ser. No. 580,854**
Claims priority, application Switzerland, Sept. 5, 1972, 13032/72
Int. Cl.² A01N *9/00, 9/22*
U.S. Cl. 424—250 **11 Claims**

1. An animal feed composition comprising, a growth promoting amount of, a compound of the formula



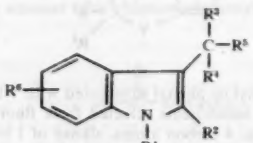
wherein
each of R_1 and R_2 is hydrogen, lower alkoxycarbonylmethyl, lower alkyl, phenyl, benzoyl, lower alkanoyl, lower alkoxycarbonyl, N,N-di-lower-alkylcarbamoyl, cyano or amino,
or R_1 and R_2 taken together is polymethylene having from 3 to 5 carbon atoms,
Y is hydrogen or halogen,
X is oxygen, sulphur, sulphinyl or sulphonyl,
Z is hydrogen, lower alkyl, trifluoromethyl, halogen or lower alkoxy, and
n is 0, 1 or 2 in a standard feed.

4,012,513
INDOLE DERIVATIVES FOR PROVIDING ANALGESIC AND ANTI-INFLAMMATORY EFFECTS

George Richard Birchall, Victoria, Australia; Walter Hepworth, and Stephen Collyer Smith, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 296,202, Oct. 10, 1972, Pat. No. 3,884,919. This application Dec. 23, 1974, Ser. No. 535,839
Claims priority, application United Kingdom, Nov. 3, 1971, 51086/71; Apr. 19, 1972, 18116/72; June 30, 1972, 30767/72
Int. Cl.² A61K *31/505*
U.S. Cl. 424—251 **8 Claims**

1. A pharmaceutical composition for use in providing an analgesic or anti-inflammatory effect comprising an effective amount of a compound of the formula:



I

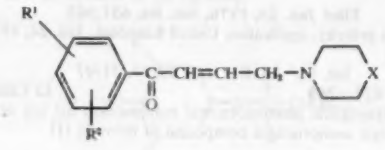
wherein R^1 is a quinazolinyl radical or a quinazolinyl radical bearing not more than two substituents selected from C_{1-5}-alkyl, C_{1-5}-alkoxy, C_{1-5}-alkylthio, amino, halogen, trifluoromethyl, trichloromethyl and phenyl substituents, the quinazolinyl radical being linked to the nitrogen atom of the indole nucleus through position 2 or 4 of the quinazolinyl radical; and R^2 stands for hydrogen or a C_{1-3}-alkyl radical; and R^3 and R^4, which may be the same or different, stand for hydrogen or a methyl radical; and R^5 is a radical of the formula $-COR^7$ wherein R^7 stands for a hydroxy, C_{1-5}-alkoxy, benzyloxy, phenoxy, di-C_{1-5}-alkylamino-C_{1-5}-alkoxy, (C_{3-6}-cycloalkyl)methoxy, amino, C_{1-5}-alkylamino or di-C_{1-5}-alkylamino and R^6 stands for hydrogen or a methylenedioxy or ethylenedioxy radical or not more than two substituents selected from C_{1-5}-alkoxy, C_{1-5}-alkyl, cycloalkyl of not more than 5 carbon atoms, and di-C_{1-5}-alkylamino radicals and halogen atoms; or a pharmaceutically-acceptable salt thereof, and an inert pharmaceutically-acceptable carrier therefor.

4,012,514
ARYL KETONES AND PRODUCTION THEREOF

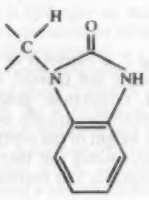
Junki Katsube, Toyonaka; Masaru Nakao, Toyonaka; Kikuo Sasajima, Toyonaka; Isamu Maruyama; Masaharu Takayama, both of Minoo; Keiichi Ono, Nishinomiya; Shigenari Katayama, Takarazuka; Yoshihiro Tanaka, Takarazuka; Shigeho Inaba, Takarawka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation-in-part of Ser. No. 316,026, Dec. 18, 1972, Pat. No. 3,922,266. This application July 29, 1975, Ser. No. 600,118
Claims priority, application Japan, Sept. 22, 1972, 47-95720; July 12, 1972, 47-70265; July 12, 1972, 47-70266; June 28, 1972, 47-65208
Int. Cl.² C07D *233/32*
U.S. Cl. 424—267 **6 Claims**

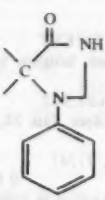
1. An olefinic aryl ketone of the formula:



wherein R^1 is fluorine, R^2 is hydrogen, and X is a group of the formula:



or



and its non-toxic salt.

4,012,515

ARYL KETONES AND PRODUCTION THEREOF

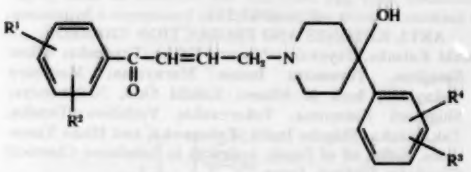
Junki Katsube; Masaru Nakao; Kikuo Sasajima, all of Toyonaka; Isamu Maruyama; Masaharu Takayama, both of Minoo; Kelichi Ono, Nishinomiya; Shigenari Katayama, Takarazuka; Yoshihiro Tanaka, Takarazuka; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation-in-part of Ser. No. 316,026, Dec. 18, 1972, Pat. No. 3,922,266. This application July 29, 1975, Ser. No. 600,119

Int. Cl.² C07D *211/52*

U.S. Cl. 424—267 6 Claims

1. An olefinic aryl ketone of the formula:



wherein R^1 is fluorine, R^2 is hydrogen, and R^3 and R^4 are each hydrogen, halogen, C_{1-4} alkyl or trifluoromethyl, and its non-toxic salt.

4,012,516

PHARMACOLOGICALLY ACTIVE COMPOSITIONS

Lawrence George Garland, Biggin Hill; Michael John Follenfant, Croydon, and James Edward Tateson, Orpington, all of England, assignors to Burroughs Wellcome Co., Raleigh, N.C.

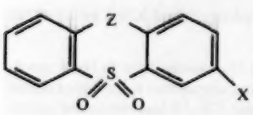
Filed Jan. 23, 1976, Ser. No. 651,903

Claims priority, application United Kingdom, Jan. 24, 1975, 3140/75

Int. Cl.² A61K *31/38, 31/39, 31/41*

U.S. Cl. 424—269 13 Claims

1. A synergistic pharmaceutical composition for use as an anti-allergic comprising a compound of formula (I)



(I)

wherein Z is oxygen or carbonyl and Z is carboxyl or 5-tetrazolyl or a pharmaceutically acceptable salt thereof, with a stimulant selected from salbutamol, terbutaline, fenoterol, trimetoquinol and carbuterol, or a pharmaceutically acceptable salt thereof, wherein the ratio by weight of the compound formula (I) or a pharmaceutically acceptable salt thereof to stimulant or a pharmaceutically acceptable salt thereof is in the range of 1:1 to 200:1.

4,012,517

COMPOSITIONS AND TREATMENT

Michael John Follenfant, Croydon, England, assignor to Burroughs Wellcome Co., Raleigh, N.C.

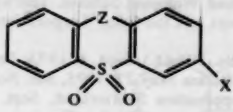
Filed Jan. 23, 1976, Ser. No. 651,902

Claims priority, application United Kingdom, Jan. 24, 1975, 3141/75

Int. Cl.² A61K *31/38, 31/39, 31/41*

U.S. Cl. 424—269 9 Claims

1. A method for treating bronchoconstriction in a mammal by dilating the bronchi of the mammal comprising administration to a mammal having a bronchoconstriction of a non-toxic effective bronchodilating amount of a compound of formula (I)



(I)

where Z is carbonyl or oxygen and X is 5-tetrazolyl or carboxyl, and pharmaceutically acceptable salts thereof.

4,012,518

NITRO-β-LACTAM ANTIBIOTICS AND PROCESSES FOR THEIR PREPARATION AND USE

Wolfgang Krohn, Leverkusen; Karl Georg Metzger; Michael Preiss, both of Wuppertal, and Michael Walkowiak, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

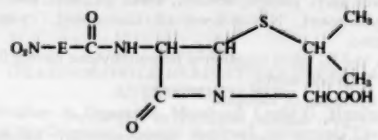
Filed Aug. 8, 1975, Ser. No. 602,969

Claims priority, application Germany, Aug. 22, 1974, 2440268

Int. Cl.² C07D *499/46*

U.S. Cl. 424—271 13 Claims

1. A compound selected from the group consisting of a penicillin of the formula:



and the pharmaceutically acceptable salts thereof wherein O_2N-E is nitroalkyl of 1 to 6 carbon atoms.

4,012,519

FUNGICIDAL 3-(N-ACYL-N-ARYLAMINO) LACTONES AND LACTAMS

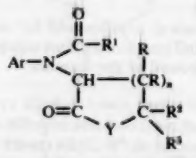
David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 548,660, Feb. 10, 1975, Pat. No. 3,933,860. This application Nov. 12, 1975, Ser. No. 631,351

Int. Cl.² A01N *9/20*

U.S. Cl. 424—274 15 Claims

1. A compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R is hydrogen or alkyl of 1 to 6 carbon atoms; R^1 is alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 3 carbon atoms and 1 to 5 of the same or different halogen selected from fluoro, chloro, or bromo, halovinyl of 1 to 3 of the same or different halogens selected from fluoro, chloro or bromo, phenyl, or phenyl substituted with 1 to 3 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms,

alkoxy of 1 to 4 carbon atoms or nitro; R^2 is hydrogen or alkyl of 1 to 6 carbon atoms; R^3 is hydrogen or alkyl of 1 to 6 carbon atoms; n is 1 or 2; and Y is N-R^4 wherein R^4 is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro.

6. A method for the control of fungi which comprises contacting said fungi or their habitats with a fungicidally effective amount of the compound of claim 1.

4,012,520
COMPOSITION AND METHOD OF PRODUCING INFERTILITY IN MALE RODENTS

Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

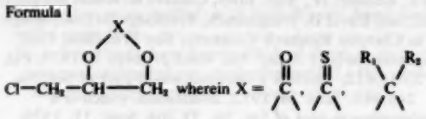
Division of Ser. No. 386,536, Aug. 8, 1973, Pat. No. 3,930,012, which is a continuation of Ser. No. 93,383, Nov. 27, 1970, abandoned. This application Aug. 4, 1975, Ser. No. 601,487

Int. Cl.² A01N 9/12

U.S. Cl. 424—278 **4 Claims**

1. A pharmaceutical preparation in the form of an oral ration for rodents consisting essentially of an effective amount for producing epididymal lesions and infertility in male rodents of the formula:

Formula I



and R_1 and R_2 are the same or different and are hydrogen, alkyl of from 1 to 17 carbon atoms, alkenyl of from 2 to 17 carbon atoms, phenyl, a 4-chloromethyl-2-thio-1,3-dioxolane for preventing impregnation of receptive sexually mature female rodents by the male counterparts thereof, compounded with an ingestible bulking agent acceptable to said rodents, said ration providing at least about 5 mg./kg. of male rodent body weight.

4,012,521
FUNGICIDE

Karl Kiehs, Lampertheim, and Ernst-Heinrich Pommer, Limburgerhof, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

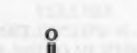
Filed May 6, 1970, Ser. No. 35,264

Claims priority, application Germany, May 6, 1969, 1923019

Int. Cl.² A01N 9/12, 9/24

U.S. Cl. 424—301 **3 Claims**

1. A process for controlling fungi which comprises applying to loci to be protected against fungus attack a fungicidally effective amount of a chloromethylaroyl sulfide having the formula



where Ar denotes one of naphthyl, phenyl and phenyl having 1 to 5 identical or different substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, phenoxy, pyridyloxy, halogen, halomethyl, nitro, lower alkylmercapto, lower alkenylmercapto, phenylmercapto, lower alkylsulfonyl, allylsulfonyl, phenylsulfonyl, dimethylamino, diethylamino, phenylamino, phenyl sulfamido, tolyl sulfamido, lower alkyl amidosulfonyl, acetyl, propionyl, benzoyl, naphthoyl and chloromethylthiocarbonyl radicals.

4,012,522
PESTICIDAL CYCLOPROPANE DERIVATIVES

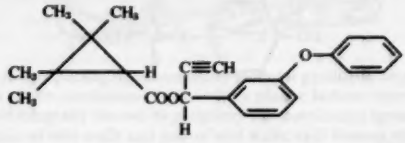
Robert J. G. Searle, Rodmersham Green, near Sittingbourne, and Roger E. Woodall, Borden, near Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 442,992, Feb. 2, 1974, Pat. No. 3,979,424. This application Sept. 9, 1975, Ser. No. 611,758

Int. Cl.² A01N 9/24

U.S. Cl. 424—305 **2 Claims**

1. A method of combating insect pests at a locus which comprises applying to the locus an insecticidally effective amount of a cyclopropane derivative of the formula



4,012,523
HYPOLIPIDEMIC 2-(3,5-DI-TERT-BUTYL-4-HYDROXYPHENYL)-(THIO OR SULFONYL) ALKANOIC ACIDS AND DERIVATIVES

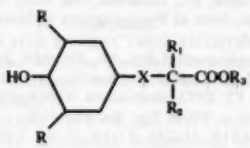
Eugene R. Wagner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 436,245, Jan. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 332,323, Feb. 14, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,434

Int. Cl.² A61K 31/19, 31/235; C07C 65/00, 149/40

U.S. Cl. 424—308 **62 Claims**

1. A compound of the formula:



wherein

each R represents a tert-butyl group;

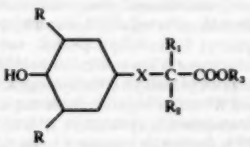
X represents S or SO_2;

R_1 is hydrogen or methyl;

R_2 represents an alkyl group containing from 1 to about 6 carbon atoms;

R_3 represents hydrogen or an alkyl group containing from 1 to about 3 carbon atoms with the proviso that when X is S, R_3 is hydrogen, or the pharmaceutically-acceptable acid addition salts thereof,

31. A method for treating hyperlipidemia in the blood of a mammal which comprises internally administering to said mammal a hypolipidemically effective amount of a compound having the formula:



wherein

each R represents a tert-butyl group;

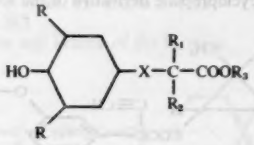
X represents sulfur or SO_2;

R_1 is hydrogen or methyl;

R_2 represents an alkyl group containing from 1 to about 6 carbon atoms;

R_3 represents hydrogen or an alkyl group containing from 1to about 3 carbon atoms, or the pharmaceutically-acceptable acid addition salts thereof.

45. A method of treating hypertriglyceridemia in the blood of a mammal comprising internally administering to said mammal a hypotriglyceridemically effective amount of a compound having the formula:



wherein

each R represents a tert-butyl group;

X is sulfur or SO_2;

R_1 is hydrogen or methyl;

R_2 represents an alkyl group containing from 1 to about 6 carbon atoms;

R_3 represents hydrogen or an alkyl group containing from 1 to about 3 carbon atoms, or a pharmaceutically-acceptable acid addition salt thereof.

4,012,524

[1-HYDROXY-5-INDANYLOXY (OR THIO)]-ALKANOIC ACIDS

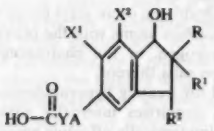
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 492,944, July 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 405,965, Oct. 12, 1973, abandoned. This application June 10, 1975, Ser. No. 585,435

Int. Cl.² A61K *31/235, 31/19, 31/41;* **C07D** *257/04*

U.S. Cl. 424—308 **13 Claims**

13. A method for the treatment of edema and hypertension in a patient which comprises administering thereto a unitary dosage of from 50 to 500 mg. of a compound of the formula:



wherein A is oxygen, R is lower alkyl, cycloalkyl having from 3 – 6 nuclear carbon atoms, phenyl and substituted phenyl wherein the substituent is halo or lower alkyl; R^1 is hydrogen, lower alkyl, phenyl lower alkyl, phenyl, substituted phenyl wherein the substituent is lower alkyl or halo; or R and R^1 may be joined to form a cycloalkyl; R^2 is hydrogen, phenyl or lower alkyl or R^1 and R^2 taken together with the carbon atoms to which they are attached, is cycloalkyl; X^1 is hydrogen, methyl, or halo and X^2 is methyl or halo or X^1 and X^2 may be joined to form a hydrocarbylene chain containing 3 to 4 carbon atoms and Y is alkylene or haloalkylene containing a maximum of 4 carbon atoms, a non-toxic, pharmacologically acceptable salt thereof or a lower alkyl ester derivative thereof in a total daily dose of from 50 mg. to 2000 mg.

4,012,525

NOVEL PROPOXYPHENE DOSAGE REGIMEN

Patrick J. Murphy, and Rodney C. Nickander, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 10, 1975, Ser. No. 621,263

Int. Cl.² A61K *31/22*

U.S. Cl. 424—311 **2 Claims**

1. The method of enhancing the analgesia produced in mammals by oral administration thereto of d-propoxyphene or a pharmaceutically-acceptable salt thereof which comprises administering during the initial period during which it is desired to produce analgesia, a loading dose of from 10–20 mg. of l-propoxyphene free base equivalent for each 5 mg. dose of d-propoxyphene free base equivalent administered or from 5–10 mg. of l-propoxyphene free base equivalent for each 10 mg. dose of d-propoxyphene free base equivalent administered and then continuing administration of d-propoxyphene alone at the same dose level as in the initial period.

4,012,526

OXYMETHYLENE DI-CARBOXYLIC ACID ESTERS AS ANTI-FUNGAL AGENTS AND ANIMAL GROWTH PROMOTERS

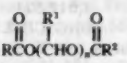
Daniel L. Kensler, Jr., Adel, Iowa; Gustave K. Kohn, Berkeley, Calif., and David D. Walgenbach, Brookings, S. Dak., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 468,629, May 9, 1974, Pat. No. 3,931,412, which is a continuation-in-part of Ser. No. 266,945, June 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,364, Sept. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 871,940, Oct. 28, 1969, abandoned. This application July 21, 1975, Ser. No. 597,855

Int. Cl.² A61K *31/225*

U.S. Cl. 424—313 **10 Claims**

1. A method for improving utilization of feed in animals which comprises orally administering to said animals a daily amount of about 0.04 mg to about 80 mg per kg of body weight of a di-ester of the formula



wherein R is alkyl of 1 to 6 carbon atoms or alkenyl of 2 to 6 carbon atoms, R^2 is alkyl of 1 to 6 carbon atoms, and R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, chloroalkyl of 1 to 4 carbon atoms and 1 to 5 chloro groups, alkenyl of 2 to 6 carbon atoms, phenyl, or alkphenyl of 7 to 10 carbon atoms, and *n* is 1, 2 or 3.

4,012,527

N,N-DIMETHYL-N'-PHENYLTHIOCARBAMYL FORMAMIDINE HYDROCHLORIDE AND ITS USE AS AN ANTI-INFLAMMATORY AGENT

Jack R. DeBaun, Sunnyvale; Ferenc M. Pallos, Walnut Creek, and Eugene G. Teach, El Cerrito, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 15, 1975, Ser. No. 613,673

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² A61K *31/17;* **C07C** *127/15, 127/19*

U.S. Cl. 424—323 **2 Claims**

1. N,N-dimethyl-N'-phenylthiocarbamyl formamidine hydrochloride.

4,012,528
α-AMINOALKYL-3-(1,2-DIHYDROXYETHYL)-4-HYDROXY-BENZYL ALCOHOLS HAVING β-ADRENERGIC STIMULANT ACTIVITY

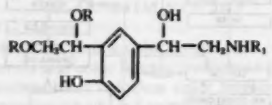
Timothy Yu-Wen Jen, Broomall, Pa.; Carl Kaiser, Haddon Heights, and Joe R. Wardell, Willingboro, both of N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 475,675, June 3, 1974, abandoned. This application June 13, 1975, Ser. No. 586,828
Claims priority, application United Kingdom, May 5, 1975, 18669/75

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 19 Claims

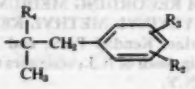
13. A method of producing β-adrenergic stimulant activity which comprises administering internally to animals in need thereof an amount sufficient to produce said activity of a chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

R is hydrogen or methyl, with both R's not being methyl at the same time;

R_1 is branched chain lower alkyl of from 3 to 5 carbon atoms, cycloalkyl or cycloalkylmethyl, the cycloalkyl moiety having from 3 to 6 carbon atoms, or



R_2 and R_3 are hydrogen, hydroxy, methoxy, or, taken together in adjacent position, methylenedioxy; and

R_4 is hydrogen or methyl.

4,012,529
CONTROL OF MARINE BORER ATTACK ON WOOD

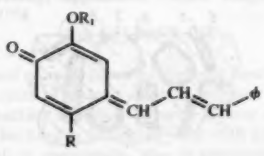
John Dale Bultman, Washington, D.C.; Leonard Jurd, Berkeley, Calif., and Ruth D. Turner, Cambridge, Mass., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 667,056

Int. Cl.² A01N *9/02, 9/26;* A61L *13/00;* B27K *3/38*

U.S. Cl. 424—331 8 Claims

1. A process for inhibiting the deterioration of wood due to attack by marine boring organisms, which comprises applying to the wood a compound of the structure



wherein R is lower alkyl and R_1 is selected from the group consisting of lower alkyl and hydrogen, in an amount sufficient to destroy the larvae of said marine boring organisms.

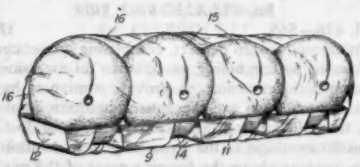
4,012,530
PRODUCE TRAY

Morell J. Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 7, 1975, Ser. No. 593,615

Int. Cl.² B65D *85/34, 65/16, 1/36*

U.S. Cl. 426—124 5 Claims



1. A tray packaging substantially globular produce comprising a single, continuous substantially planar bottom member joined integrally around its periphery to a continuous upstanding pair of side walls and pair of end walls; said bottom member being interrupted by a plurality of uniformly spaced concave ribs extending upwardly from said bottom member into said side walls and extending from side wall to side wall, thus forming saddle-like members whose concave profile defines an arc of a circle and each of which cradle substantially globular produce; said saddle-like members being aligned in a single row with planar sections of said bottom separating said saddle-like members; the width of each saddle-like member being between about 0.5 inch and about 1.5 inches and the space between adjacent saddle-like members being between about 1 inch and about 2 inches, said width being sufficient to cradle and support one article of produce when said produce is positioned on adjacent members.

4,012,531
PROCESS FOR EXTRACTING ANTIOXYDANTS

Rinantonio Viani, Attalens, Switzerland, assignor to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,399
Claims priority, application Switzerland, Oct. 26, 1973, 15150/73

Int. Cl.² A23L *1/28*

U.S. Cl. 426—431 9 Claims

1. A process for extracting antioxidant substances from an organic plant material of the Labiate or Umbellifer family containing them, wherein the organic material is treated with an aqueous basic buffer solution with a pH value of from 7 to about 11.5, the insoluble fraction is separated and the soluble fraction containing the antioxidant substances is collected.

4,012,532
METHOD FOR CONDITIONING FOOD STRANDS

Marvi D. Moore, Dallas, and David P. Fowler, Irving, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Dec. 13, 1972, Ser. No. 314,600

Int. Cl.² A23L *1/16*

U.S. Cl. 426—451 7 Claims

1. A process for conditioning strands of food material which comprises forming a dough of said food material, forming said dough into a plurality of strands, passing each said strand individually through a separate elongated, vertical zone of positive air pressure, all of said elongated, vertical zones being located in a larger zone of positive air pressure, the air in said larger zone being under greater pressure than the air outside of said larger zone, and thereafter cutting the said strands into pieces.

4,012,533

MULTIPURPOSE WHIPPED DESSERT AND METHOD OF MANUFACTURING

John J. Jonas, Winnetka, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Nov. 17, 1975, Ser. No. 632,858
Claims priority, application United Kingdom, Nov. 20, 1974, 50212/74
Int. Cl.² A23G 9/02, 9/04
U.S. Cl. 426—565 18 Claims

1. An aerated frozen dessert, comprising an aerated frozen foam formed by combining an aqueous fat emulsion and an aqueous protein emulsion, to provide a mixture having the aqueous fat emulsion and the aqueous protein emulsion present in the ratio of from about 65:35 to about 35:65 of the aqueous fat emulsion to the aqueous protein emulsion, whipping the mixture above the freezing point of the mixture and subsequently freezing the whipped mixture to provide the aerated frozen dessert, said dessert including between about 10 and about 32 percent by weight edible fat, between about 1.5 and about 7 percent by weight water soluble whippable protein, sweeteners, emulsifiers and gum stabilizers, said dessert having a fat churn out of between about 10 percent and about 30 percent, said dessert having an overrun between about 150 and 250 percent, said dessert, when frozen, being spoonable and having organoleptic properties similar to ice cream, said dessert, when thawed, having organoleptic properties of whipped topping, and being resistant to syneresis when held at room temperature for 6 hours, said dessert being freeze-thaw stable.

4,012,534

PREPARATION OF PROCESS CHEESE

Thomas P. Kichline, Chesterfield, and Allen H. Kranz, Florissant, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 411,609, Nov. 1, 1973, Pat. No. 3,957,679. This application May 15, 1975, Ser. No. 577,812
Int. Cl.² A23C 19/00, 19/12
U.S. Cl. 426—582 4 Claims

1. A process cheese formulation containing cheese and, in an effective emulsifying amount, a sodium aluminum phosphate composition having an empirical formula

$$x\ Na_2O \cdot y\ Al_2O_3 \cdot 8\ P_2O_5 \cdot z\ H_2O$$

wherein x is a number higher than 15 up to and inclusive of 24, y is a number 1.0 and 3.9 inclusive, and z is a number between 0 and 50 inclusive.

4,012,535

MOLASSES IMPREGNATED BAGASSE PITH ANIMAL FEED

Richard J. Fiala, Decatur, Ill.; Thomas L. Scott, Raceland, La., and Kenneth N. Wright, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

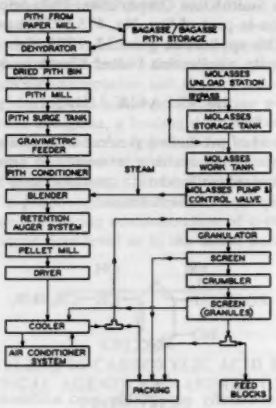
Filed Sept. 3, 1974, Ser. No. 502,470
Int. Cl.² A23K 1/02
U.S. Cl. 426—658 22 Claims

1. A process for making a high molasses animal feed, having a bulk density of at least 20 pounds per cubic foot, containing at least 60% by weight dry solids basis molasses, the steps comprising:

a. preconditioning a molasses absorptive carrier material to a moisture content of less than 5% by weight to obtain a maximum molasses absorption of at least 60% by weight dry solids molasses, based on the weight of the carrier, dry solids basis;

b. intimately mixing said absorptive carrier material with a preheated, high brix liquid molasses containing no more than about 30% by weight water to obtain a molasses/carrier blend having a moisture content in the range of at least about 10% by weight of the molasses/carrier blend;

c. wet pelleting said molasses/carrier blend at a temperature in the range of 100°–130° F. in the absence of added steam to obtain moist, thoroughly blended discrete pellets having a substantially increased bulk density and a moisture content substantially unchanged from that of the molasses/carrier blend; and



d. thereafter drying said pellets to a moisture content below about 4% by weight said dry pellets containing at least 60% by weight dry solids basis molasses and having a bulk density of at least 20 pounds per cubic foot.

4,012,536

ELECTRON BEAM RECORDING MEDIUM COMPRISING 1-METHYLVINYL METHYL KETONE

Aaron William Levine, Kendall Park, and Michael Kaplan, Franklin Township, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 314,975, Dec. 14, 1972, abandoned. This application Aug. 14, 1975, Ser. No. 604,776
Int. Cl.² B05C 5/00; G03C 1/68
U.S. Cl. 427—43 7 Claims

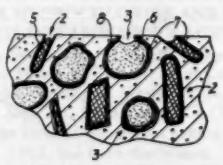
1. An electron beam recording medium which comprises a support, an electrically conductive layer and an electron beam-sensitive film thereon, said film consisting essentially of a polymer of 1-methylvinyl methyl ketone.

4,012,537

DE-ICING COMPOSITIONS CONTAINED IN ROAD SURFACE MATERIAL

Robert Dubois, La Croix, Lutry, Switzerland, assignor to Plastiroute SA, Switzerland

Filed June 7, 1974, Ser. No. 477,338
Claims priority, application Switzerland, June 13, 1973, 8506/73; May 14, 1974, 6553/74
Int. Cl.² C09K 3/18
U.S. Cl. 427—138 8 Claims



1. An asphalt or bituminous based road surfacing material having dispersed therein 2 to 7% by weight of an ice-preven-

tion and snow-thawing mixture of discrete particles of a calcium halide and an alkali metal hydroxide in the ratio of 15 to 20 parts by weight of halide for 1 part of hydroxide, said particles having a substantially water-tight coating which can be mechanically destroyed to expose said particles of the mixture.

4,012,538

METHOD OF FORMING COLOR IMAGES EMPLOYING DESENSITIZING AGENTS

Akio Miyamoto, and Hiroharu Matsukawa, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

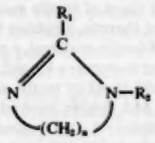
Continuation of Ser. No. 425,902, Dec. 17, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,902

Claims priority, application Japan, Dec. 18, 1972, 47-126861

Int. Cl.² B41M *5/12, 5/18*

U.S. Cl. 427—145 **13 Claims**

1. In a method of forming color images on a color recording material wherein said color images are formed by the reaction between a substantially colorless color former and a developer, the improvement which comprises desensitizing portions of the color recording material where the formation of color images is not required by applying to the developer in these portions before contact with the colorless color former a desensitizer composition containing at least one of an amidine represented by the general formula (I)



(I)

wherein R_1 and R_2 each represent an alkyl group having 1 to 8 carbon atoms, R_1 and R_2 can form a C_2 to C_{11} ring which can be substituted by alkyl groups having 1 to 4 carbon atoms, and n represents 2 to 6, or an amidine derivative which is the reaction product of an amidine of the general formula (I) with a phenol, a carboxylic acid, carbonic acid or phosphoric acid whereby said desensitizer composition desensitizes portions of a recording material utilizing color formation by the contact between a substantially colorless color former and a developer where the formation of color images is not desired.

4,012,539

METHOD OF APPLYING AND BONDING A BEARING LINING COMPRISING A MIXTURE OF AN ARYLENE SULPHIDE POLYMER AND A METALLIC OXIDE TO A BACKING MATERIAL

Glyndwr John Davies, London, England, assignor to The Glacier Metal Company Limited, Wembley, England

Filed Aug. 14, 1975, Ser. No. 604,842

Claims priority, application United Kingdom, Aug. 21, 1974, 36669/74

Int. Cl.² B05D *3/02*

U.S. Cl. 427—195 **10 Claims**

1. A method of applying and bonding a bearing lining comprising a mixture of arylene sulphide polymer and a metallic oxide to a backing in which uncured arylene sulphide is applied to the backing in powdered form with an oxide of copper, tin, lead, or manganese, also in powdered form, in the proportion of about 5–95 by weight of the arylene sulphide polymer, and is cured by heating at a temperature of at least 370° C. in the presence of oxygen substantially provided by said oxide.

4,012,540

METHOD OF CONDITIONING FABRICS IN A CLOTHES DRYER

Agnes R. McQueary, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 347,605, April 3, 1973, Pat. No. 3,944,694. This application Nov. 10, 1975, Ser. No. 630,381 The portion of the term of this patent subsequent to Mar. 6, 1993, has been disclaimed.

Int. Cl.² B05D *3/12*

U.S. Cl. 427—242 **3 Claims**

1. The method of conditioning fabrics in a laundry dryer which comprises commingling said fabrics in said dryer with a fabric-conditioning article comprising a flexible web substrate carrying a fabric-conditioning agent removable to fabrics by contact therewith, said fabric-conditioning article having slit openings sufficient in size and number as to permit at least 75% of the normal volume of air flow through said dryer when said article is used therein.

4,012,541

METHOD FOR WETTING HYDROPHOBIC DIAPHRAGMS FOR USE IN CHLOR-ALKALI CELLS

Stanley T. Hirozawa, Birmingham, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 1, 1975, Ser. No. 618,446

Int. Cl.² B05D *1/18;* **C25B** *13/08*

U.S. Cl. 427—243 **29 Claims**

1. A method of preparing for use in a chlor-alkali cell a diaphragm of crystalline, highly expanded microporous polytetrafluoroethylene film, said method comprising the steps of immersing said diaphragm in a solution in a solvent selected from the group consisting of 2-propanol, n-propanol, ethanol and methanol, and containing an amount of an acetal-type nonionic surfactant effective to promote wetting of said diaphragm, rinsing said diaphragm in deionized water, immersing said diaphragm in an aqueous solution of an acetal-type nonionic surfactant under conditions of surfactant concentration and time effective to promote wetting of said diaphragm, and immersing said diaphragm in a solution of brine containing 100 to 200 grams per liter of sodium chloride and an amount effective to promote wetting of said diaphragm of acetal-type nonionic surfactant, for a period of time of at least three hours, and then installing said diaphragm in a chlor-alkali cell.

4,012,542

RIGID THERMOSETTING LOAD BEARING COMPOSITIONS

Stanley Oswitch, Chagrin Falls; Robert F. Golownia, Northfield, and Kevin K. Kipp, Solon, all of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 353,501, April 23, 1973, Pat. No. 3,914,200, which is a continuation-in-part of Ser. No. 221,430, Jan. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 846,592, July 31, 1969, abandoned. This application Mar. 12, 1975, Ser. No. 557,776

Int. Cl.² C08G *63/52;* **B05D** *3/10*

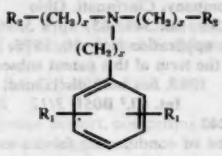
U.S. Cl. 427—302 **14 Claims**

1. A process for forming at a selected time a polymerization reaction product from a pre-catalyzed polyester resin which normally undergoes substantially immediate polymerization due to the presence of such catalyst, comprising:

a. adding to a liquid, curable, thermosetting, unsaturated polyester resin containing a sufficient amount of a peroxide catalyst normally adapted to catalyze further polymerization of said polyester resin, an excessive amount of an inhibitor of sufficiently more than 0.02% by weight of the resin to inhibit catalyzation of the polyester resin by said catalyst for a predetermined time following addition of said inhibitor, and

b. at said selected time contacting said pre-catalyzed, inhibited polyester resin with an accelerator combination

consisting essentially of a metal soap in which the metal is capable of redox reaction and an aromatic, tertiary amine having the formula:



in which R_1 represents hydrogen, CH_3 or halogen; R_2 represents alkyl up to 4 carbon atoms, R_3OH in which R_3 represents alkylene up to 4 carbon atoms, or phenyl; and in which the R_1's and the R_2's may be the same or different and x is 0 or 1, said metal soap and amine being present in a weight ratio of about 1:10 to about 1:1, respectively, said accelerator combination being used in sufficient amount to overcome the inhibition of said inhibitor and permit catalyzation of the polyester resin by said peroxide catalyst to cure the resin within less than 1 hour.

4,012,543
COATED PAPER AND METHOD OF MAKING SAME

Howard Lee Ranger, West Buxton; Mahlon Randall Kirk, South Windham, and Abbott Woodward Mosher, Gorham, all of Maine, assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 39,849, May 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 836,592, June 25, 1969, abandoned. This application Aug. 8, 1974, Ser. No. 495,808

Int. Cl.² B44D *1/44*

U.S. Cl. 427—361 **24 Claims**

1. A method for the preparation of a uniformly, densely coated paper substrate displaying excellent ink holdout properties, characterized by high bulk, increased brightness and opacity, and a gloss value of at least 50, which method essentially consists of:

i. applying a coating of an aqueous top coating composition to at least one surface of a given fibrous cellulosic substrate;

ii. said fibrous cellulosic substrate having been prepared to resist penetration of the said aqueous top coating composition;

iii. said aqueous top coating composition having a total solids content of at least about 60 percent by weight, and said solids content thereof comprising a major proportion of a paper-coating grade pigment, a minor proportion of a thermoplastic binder and a minor amount of an anti-sticking agent; thence

iv. gloss-calendering, temporarily plasticizing and molding said coated substrate by conveying same through a nip formed between a heated polished drum and a resilient backing roll to at least partially coalesce the thermoplastic binder content of the said aqueous top coating composition;

v. the temperature of said heated polished drum ranging from between about 82° to 150° C. and the pressure exerted on said coated substrate in said nip ranging from between about 400 to 800 pounds per lineal inch;

vi. the amount of water loss from the said top coating in that time interval between the application (i) thereof and the gloss-calendering and molding operation (iv) being less than that amount such as would effect substantial decrease in resultant high gloss;

vii. the temperature of the said coated substrate not being elevated to a value substantially above about 60° C. in the said time interval between the application (i) and the gloss-calendering and molding operation (iv);

viii. concomitantly, the water content of the said top coating, at the point of entry of the said coated substrate into the said nip, is such that, in the absence of the said minor proportion of anti-sticking agent, the substrate coating would stick to the surface of the said gloss-calendering, heated polished drum; and

ix. removing the thus coated and gloss-calendered fibrous cellulosic substrate from contact with the said heated polished drum and resilient backing roll as same emerges from the said nip formed therebetween;

x. whereby there is recovered a smooth, molded, polished, high gloss fibrous cellulosic substrate having the high bulk and density characteristics of lightly machine-calendered paper, albeit its said coating is itself dense, uniform and provides excellent ink holdout.

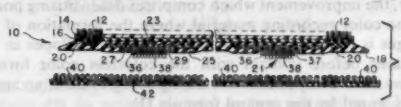
4,012,544
DUST COLLECTION MAT AND METHOD OF MANUFACTURE

Ernest Levon Richards, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed June 12, 1975, Ser. No. 586,154

Int. Cl.² D03D *27/00*; D04H *11/00*

U.S. Cl. 428—95 **2 Claims**



2. A mat comprising: a sheet of textile material, a plurality of tufts of yarn connected thereto, a rubber backing material laminated to said sheet of textile material, a plurality of openings in said rubber backing material, a looped fabric located in said openings between said sheet of textile material and said rubber backing material and double hooked member having the hooks on one side engaging said looped fabric and the hooks on the other side adapted to engage a carpet-like material.

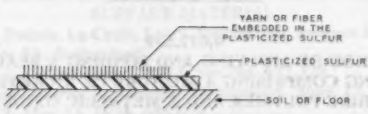
4,012,545
TURF HAVING SOLIDIFIED PLASTICIZED SULFUR BACKING

William G. Toland, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 474,457, May 29, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,500

Int. Cl.² D03D *27/00*; D04H *11/00*

U.S. Cl. 428—95 **8 Claims**



1. A manufacture comprising a plurality of fibers partially embedded in a solidified plasticized sulfur matrix with one end of the fibers extending outward from the matrix to form a turf or carpet-like surface.

4,012,546
FLAME-RETARDANT CARPET

Judd Leonard Schwartz, Chester, and Richard Eugene Mayer, Richmond, both of Va., assignors to Allied Chemical Corporation, N.J.

Filed Aug. 6, 1976, Ser. No. 712,287

Int. Cl.² D03D *27/00*; D04H *11/00*

U.S. Cl. 428—95 **14 Claims**

1. A flame-retardant pile carpet having a relatively pliable

primary backing and a tufted surface, said surface being comprised of fibers selected from the group consisting of polyester and polyamide fibers having incorporated therein from 0.05 to 15 percent by weight of a metal compound selected from the group consisting of antimony oxide and zinc borate, said fibers being bonded to said backing with a bonding substance comprising a latex material selected from the group consisting of vinyl chloride and vinylidene chloride polymers and copolymers, and a hydrate material selected from the group consisting of aluminum hydroxide and hydrated aluminum oxide, the ratio by weight of said latex material to said hydrate material being within the range 1:2 to 1:4.5.

4,012,547

HIGH PERFORMANCE HOT MELT ADHESIVE BACKSIZING COMPOSITIONS AND CARPET MADE THEREWITH

George Elmer Smedberg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 509,562, Sept. 26, 1974, Pat. No. 3,914,489. This application July 18, 1975, Ser. No. 597,140

Int. Cl.² D03D *27/00*; D04H *11/00*

U.S. Cl. 428—97 **10 Claims**

1. A composition having a tensile elongation of about 50 to 400 percent comprising

A. about 3 to 15 weight percent ethylene/vinyl ester copolymer having a melt index of about 2 to 100, a copolymerized ethylene content of about 67 to 90 weight percent, a copolymerized vinyl ester content of about 10 to 33 weight percent, wherein the acid moiety of said vinyl ester contains 1–4 carbon atoms,

B. about 15 to 40 weight percent of a hydrocarbon resin or a mixture of several hydrocarbon resins having a ring and ball softening point of about 50°–70° C. and a viscosity of 0.5 to 1.5 poise at 135° C.,

C. 0 to about 3 weight percent of a low molecular weight ethylene homopolymer having a molecular weight of about 1500–4000, density of 0.91–0.96 g./cm.³ and a melting point of about 220° F.–270° F.

D. 0 to about 3 weight percent of a paraffin wax,

E. 0 to 0.3 weight percent of an antioxidant, and

F. about 40 to 75 percent filler.

3. A carpet comprised of a primary backing material stitched with closely spaced erect loops of yarn to form a tufted structure, the bottom surface of the tufted structure having as a tuft bonding backsize adhesive coating the composition of claim 1, said carpet having an average tuft bind of at least 10 pounds.

4,012,548

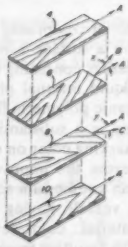
HIGH STRENGTH COMPOSITE WOOD VENEER ARTICLES

Barney Roberti, Mathews Road, Youngsville, Pa. 16371

Filed Apr. 6, 1976, Ser. No. 674,189

Int. Cl.² B32B *5/12*

U.S. Cl. 428—106 **16 Claims**



1. A composite wood veneer article comprising

a lower layer of wood veneer having a grain orientation generally in a first direction,

an upper layer of wood veneer having a grain orientation generally in said first direction,

at least two layers of wood veneer interposed between said lower and said upper layers,

at least one of said interposed layers having a grain orientation offset from said first direction by about 10° to 25°,

none of said interposed layers having a grain orientation offset from said first direction by more than about 10° to 25°,

adjacent layers of wood veneer being adhesively bonded in generally surface to surface relationship, and

said composite article being substantially rigid.

4,012,549

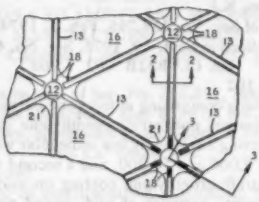
HIGH STRENGTH COMPOSITE STRUCTURE

Paul Slysh, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Oct. 10, 1974, Ser. No. 513,661

Int. Cl.² B32B *3/12*

U.S. Cl. 428—116 **10 Claims**



1. A composite structure comprising:

a skin sheet;

a uniform repeating triangular pattern of first upstanding ribs integral with said skin, across at least a portion of said skin;

a circular node at each corner of each triangle surrounded by a circular second rib;

each of said first and second ribs having a narrow first flange along the upper edge, lying substantially parallel to said skin and a narrow second flange formed by a thickened portion of said skin adjacent to said first and second ribs, whereby said first and second ribs have a substantially I-beam cross-section;

a groove in the outer surface of each flange on said first ribs filled with a composite material strip comprising high-strength fibers embedded in a supporting matrix;

said fibers being oriented substantially parallel to each other and to the supporting first rib, at least some of said fibers extending inwardly of said second rib at each node; and

said fiber strips being tapered at each end to a lesser cross-sectioned fiber density.

4,012,550

TIERED INTERLINING FOR GARMENTS

Frank Gabriel Hollander, 77-14 113th St., Forest Hills, N.Y. 11375

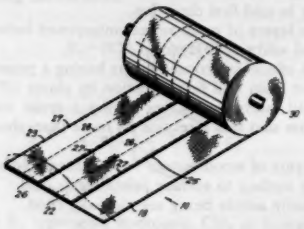
Filed Nov. 14, 1975, Ser. No. 631,825

Int. Cl.² A41B *9/02*

U.S. Cl. 428—190 **3 Claims**

1. A roll of shape holding garment interliner material comprising a base layer and a plurality of layers of successively shorter lengths from side to side of the base layer, said plurality to be disposed atop the base layer, the upper edges of all

layers being secured in registry, the lower edges thereof being successively spaced upwardly of the lower edge of the base



and of the next lower layer and secured thereto along the marginal side edge of each of said plurality of layers.

4,012,551

COATED RAZOR BLADE

Herman Bogaty, Short Hills, N.J., and Anthony John Peleckis, Trumbull, Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 439,795, Feb. 5, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 615,012

Int. Cl.² B32B *3/02, 15/08*

U.S. Cl. 428—192 **14 Claims**

1. A razor blade comprising at least one cutting edge, a first adherent continuous polytetrafluoroethylene coating on the cutting edge having a relatively low molecular weight between approximately 2,000 and 50,000, and a second adherent continuous polytetrafluoroethylene coating on said first coating comprising discrete particles of said second polytetrafluoroethylene coating having a relatively high molecular weight between approximately 50,000 and 10,000,000 sintered over said first coating to form microscopic raised portions of said second coating on said first coating along said cutting edge.

4,012,552

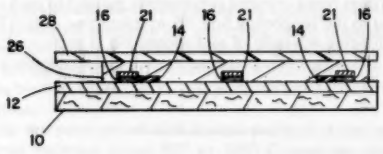
DECORATIVE METAL FILM HEAT TRANSFER DECALCOMANIA

Tom J. Watts, Sherborn, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Mar. 10, 1975, Ser. No. 556,871

Int. Cl.² B44C *1/16;* **B41M** *3/12*

U.S. Cl. 428—200 **5 Claims**



1. A preprinted heat transfer decalcomania for decorating a receiving surface with both an ink design and a metal in a predetermined pattern, which comprises a temporary carrier having a smooth release surface, a printed ink design, a first dry, transparent adhesive printed in said predetermined pattern, a film of metal bonded to and commensurate in area to said first adhesive, and a second adhesive layer overlaying said ink design and metal pattern adapted upon application of heat and pressure to adhere the decalcomania to said receiving surface.

4,012,553

RESINOUS REPAIR PAD

Lawrence M. Clemens, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 493,677, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 249,055, May 1, 1972, abandoned. This application July 7, 1975, Ser. No. 593,216

Int. Cl.² B05D *3/06*

U.S. Cl. 428—285 **10 Claims**

1. Method of making a stable exudation-resistant resin-impregnated adherent fibrous sheet material which when pressed against a receptive substrate and then exposed to actinic radiation will cure to a hard, non-tacky, solvent-resistant state and remain firmly adhered to said substrate, comprising impregnating a porous, fibrous mat with a radiation-curable sticky fluid resinous composition comprising unsaturated polyester, unsaturated liquid monomer copolymerizable therewith, and an acyloin photoinitiator, said resinous composition being present in an amount sufficient to provide the impregnated mat with a sticky surface, enclosing the impregnated mat between a transparent film and another protective supporting web, and then exposing the product to a non-reaction-sustaining amount of actinic radiation sufficient to gelatinize, but not to rigidify, the resinous composition wherein said composition remains in a stable condition substantially free of reaction-sustaining free radicals in which a portion of the composition swells, but does not dissolve when suspended for 18 hours in 1:1 acetone-toluene and in which it exhibits a decrease in penetration value of approximately one-half.

4,012,554

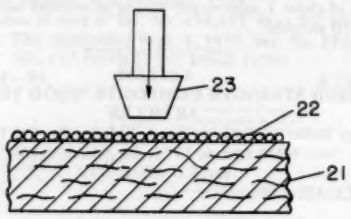
SINGLE COATING RECORD SYSTEM-SOLVENT LOSS PRODUCES COLOR

Robert E. Miller; Robert W. Brown, and Paul S. Phillips, Jr., all of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 315,723, Dec. 15, 1972, abandoned, which is a division of Ser. No. 173,559, Aug. 20, 1971, abandoned. This application Dec. 12, 1974, Ser. No. 531,932

Int. Cl.² B32B *5/16, 27/00*

U.S. Cl. 428—327 **6 Claims**



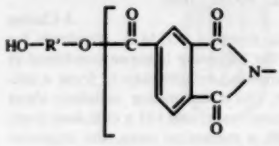
1. In a record sheet material comprising a substrate sheet having adhesively bound on a surface a multiplicity of discrete, rupturable, microcapsules consisting essentially of capsule wall material and a liquid internal phase wherein said capsule wall material is organic polymeric film forming material and said internal phase is a substantially colorless ink which yields a distinctive marking color on exposure to color-developing conditions, wherein the improvement comprises an internal phase which is an equilibrium solution comprising a volatile organic solvent vehicle having dissolved therein colorless chromogenic material, color-developing reactant material, and the colored dye resulting from reaction between the chromogenic material and the color-developing reactant material.

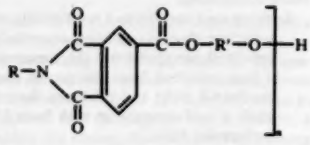
4,012,555
SELF-BONDING VARNISH FOR MAGNET WIRES COMPRISING A COMBINATION OF A POLYALKYLENETRIMELLITATE IMIDE AND A POLYALKYLENETRIMELLITATE ESTER IMIDE

Robert G. Keske, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,713
Int. Cl.² B32B *15/08*; **C08G** *78/16*; **C08L** *79/08*; **H01B** *3/30*
U.S. Cl. 428—383 **14 Claims**

1. A composition comprising a polyalkylenetrimellitate imide and a polyalkylenetrimellitate ester imide having a weight ratio of from about 1:19 to 19:1 of the respective polymers wherein said polyalkylenetrimellitate ester imide has the structure





wherein each R and each R′ is independently an alkylene group of 2–12 carbon atoms and *n* is a number sufficient to provide a polymer having an I.V. of at least 0.3 dl/g.

7. Magnet wire bearing a continuous self-bonding varnish top coat comprising the composition of claim **1**.

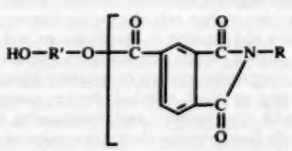
13. The article of claim **7** wherein said magnet wire bears at least one enamel subbing layer selected from the group consisting of polyester, polyester imide, polyimide and polyamideimide.

4,012,556
SELF-BONDING VARNISH FOR MAGNET WIRES COMPRISING A POLYALKYLENETRIMELLITATE ESTER IMIDE

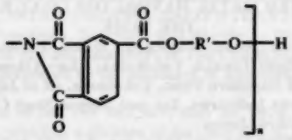
Robert G. Keske, and James R. Stephens, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,716
Int. Cl.² B32B *15/08*; **C07D** *29/34*; **C08G** *78/16*; **H01B** *3/30*
U.S. Cl. 428—383 **11 Claims**

1. Magnet wire bearing a continuous self-bonding varnish top coat comprising a poly(alkylenetrimellitate ester imide) having an I.V. of at least 0.3 dl/g of the structure



-continued



wherein each R and each R′ is independently an alkylene group of 2–12 carbon atoms and *n* is a number sufficient to provide a polymer having an I.V. of at least 0.3 dl/g.

6. The article of claim **1**, wherein said magnet wire bears at least one enamel subbing layer selected from the group consisting of a polyester, polyesterimide, polyimide and polyamideimide.

10. The article of claim **1** wherein the magnet wire is in a fabricated unbonded form.

11. The method of converting the article of claim **10** into a unitary structure, which comprises bonding the fabricated element at a temperature of 150°–300° C.

4,012,557
NYLON-6 FILAMENT AND METHOD OF MANUFACTURE THEREOF

Jean-Philippe Cornelis, Clementinalaan 40, B-9000 Gent, Belgium

Continuation-in-part of Ser. No. 365,597, May 31, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,526
Claims priority, application France, June 2, 1972, 72.20021
Int. Cl.² D02G *3/02*
U.S. Cl. 428—397 **8 Claims**

1. A method of manufacturing a synthetic filament from nylon-6 to permit yarn or fabric made therefrom to be highly pervious to ultraviolet rays consisting essentially of treating nylon-6 in powder form in an aqueous solution containing about 0.5% of an alkali-metal salt selected from the group consisting of potassium bromide and sodium bromide melt-spinning the so-treated nylon-6 by extrusion with intimate mixing through an oval-shaped orifice to form an oval-shaped extruded spun filament having a temperature of about 200° C, immediately cooling the spun filament to the Brill point thereof in order to avoid the formation of spherulites which are an obstacle to the passage of ultraviolet rays, dissolving the superficial shiny surface of the cooled filament by drawing said filament through a bath of saturated aqueous solution of copper lactate or formic acid, at a temperature of about 55° C, again cooling to the Brill point, thus providing an oval-shaped nylon-6 filament that is pervious to ultraviolet rays.

4,012,558
PROCESS FOR THE MANUFACTURE OF FLAME-RESISTANT BOARDS, A FLAME-RETARDANT MIXTURE AND A FLAME-RETARDANT BONDING COMPOSITION CONTAINING THE SAME

Eliahu Wurman, Arad, Israel, assignor to Dead Sea Bromine Company Ltd., Beer-Sheva, Israel

Filed May 22, 1974, Ser. No. 472,105
Claims priority, application Israel, May 22, 1973, 42334
Int. Cl.² C09K *3/28*; **B27K** *3/52*
U.S. Cl. 428—411 **14 Claims**

1. A flame retardant mixture adapted for incorporation into the bonding agent used in the production of chipboard, plywood and the like consisting essentially of ammonium bromide, urea phosphate and hexamethylenetetraamine, said hexamethylenetetraamine being present in a sufficient amount to inhibit the rate of gelling of said bonding agent said ammonium bromide and urea phosphate being present in flame retarding amounts.

4,012,559

RADIATION CURABLE COATING COMPOSITION AND PRECOATED METAL HAVING TOP COAT BASED ON THE SAME

Shuji Fujioka; Junichi Fujikawa; Masao Takahashi, all of Otsu; Tadashi Tanaka, Yokohama; Akira Okamoto, Yokohama, and Nagaharu Ueno, Yokohama, all of Japan, assignors to Toray Industries, Inc and Nippon Steel Corporation, both of Tokyo, Japan

Filed Oct. 30, 1975, Ser. No. 627,467

Claims priority, application Japan, Oct. 31, 1974, 49-124870

Int. Cl.² C08F *2.54*; **C08L** *31/00, 63/02*; **B32B** *15/08*

U.S. Cl. 428—463 **6 Claims**

1. A radiation curable coating composition, which comprises as essential ingredients:

A. 100 parts by weight of an acrylic copolymer having a number average molecular weight of 15,000 to 800,000 and predominantly comprised of polymerized units of at least one acrylic ester selected from acrylic acid esters and alpha-substituted acrylic acid esters, and having a solubility parameter of from 9.1 to 10.8,

B. 5 to 150 parts by weight of at least one polyfunctional compound having a molecular weight of not greater than 2,000 and at least two radical-polymerizable double bonds in the molecule, and;

C. 0.2 to 15 parts by weight of at least one non-polymerizable and non-volatile organic compound having a molecular weight of not greater than 3,000 and having a solubility parameter of from 8.3 to 10.9.

6. A precoated metal material which comprises a metal substrate and a cured top coating bonded to said substrate directly or via a primer coating, said top coating being based on a radiation curable coating composition comprising as essential ingredients:

A. 100 parts by weight of an acrylic copolymer having a number average molecular weight of 15,000 to 800,000 and predominantly comprised of polymerized units of at least one acrylic ester selected from acrylic acid esters and alpha-substituted acrylic acid esters, having a solubility parameter of from 9.1 to 10.8;

B. 5 to 150 parts by weight of at least one polyfunctional compound having a molecular weight of not greater than 2,000 and at least two radical-polymerizable double bonds in the molecule, and

C. 0.2 to 15 parts by weight of at least one non-polymerizable and non-volatile organic compound having a molecular weight of not greater than 3,000 having a solubility parameter of from 8.3 to 10.9.

4,012,560

ARTICLES COATED WITH PRESSURE-SENSITIVE INTERPOLYMERS CONTAINING 2-ACRYLAMIDO-2-METHYLPROPANESULFONIC ACID

James C. Baatz, West Springfield, and Albert E. Corey, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 475,062, May 31, 1974, Pat. No. 3,931,087. This application Nov. 3, 1975, Ser. No. 628,005

Int. Cl.² C09H *7/02, 7/04*; **B32B** *27/06*

U.S. Cl. 428—474 **8 Claims**

1. An article of manufacture comprising a substrate coated on at least one side with a pressure-sensitive interpolymer comprising:

A. from 0.1 to 1.5 weight percent of 2-acrylamido-2-methylpropanesulfonic acid, and

B. at least one monomer selected from the group consisting of esters of acrylic acid and methacrylic acid containing from 6 to 20 carbon atoms, alone, or with

C. a monomer selected from the group consisting of alpha-olefins containing from 2 to 10 carbon atoms, vinyl esters of alkanoic acids containing from 3 to 10 carbon atoms, ethyl and methyl esters of acrylic and methacrylic acids, acrylonitrile, methacrylonitrile, styrene, vinyl toluene, and vinyl chloride,

wherein the interpolymer has a weight average molecular weight in the range 10,000 to 1,000,000 and a glass transition temperature in the range of −15° to −75° C.

4,012,561

DECORATIVE LAMINATE WITH CARE OF NEWSPRINT AND WOOD PULP

Joseph B. Doughty, Sullivan's Island, and Carl F. Schulerud, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 328,260, Jan. 31, 1973, abandoned. This application June 2, 1975, Ser. No. 583,042

Int. Cl.² B32B *23/06*

U.S. Cl. 428—531 **3 Claims**

1. A decorative laminate meeting N.E.M.A. standards for surface veneering having the following laminae combined in order of ascending superimposed relationship to form a unitary structure, (a) a core, (b) a decorative cellulose sheet impregnated with a melamine resin, and (c) a cellulose overlay sheet impregnated with a melamine resin, the improvement comprising,

forming said core from a multiplicity of core sheets, each of said core sheets consisting essentially of from 10 to 100% repulped newsprint and the remainder of said sheet being a pulp selected from the group consisting of pine pulp, hardwood pulp and mixtures thereof, and impregnating each of said core sheets with from 10 to 70% by weight of a phenolic resin.

4,012,562

MODULAR ELECTRICAL ENERGY STORAGE DEVICE

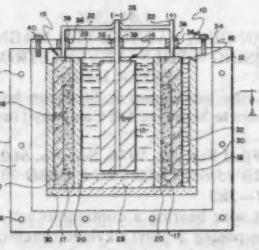
Richard C. Saunders, Simi, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 512,818, Oct. 7, 1974. This application Nov. 28, 1975, Ser. No. 635,825

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.² H01M *4/36*

U.S. Cl. 429—103 **7 Claims**



1. An electrical energy storage device comprising:

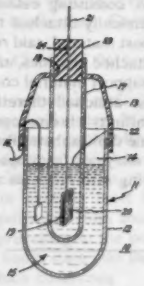
a housing which contains device components including positive and negative electrode means positioned therein, ion-conductive molten salt electrolyte disposed between said positive and negative electrode means and in contact therewith, and a resilient carbonaceous body of at least partially compressed carbon or graphite fibers for resiliently urging at least selected device components in contact with one another and maintaining them in a substantially fixed position during operation of the device at elevated temperatures.

4,012,563

SEALED LITHIUM-SODIUM ELECTROCHEMICAL CELL WITH SODIUM BETA-ALUMINA ELECTROLYTE

Gregory C. Farrington, Elnora, and Walter L. Roth, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,945
Int. Cl.² H01M 4/36
U.S. Cl. 429—104 6 Claims



1. A sealed lithium-sodium electrochemical cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium-sodium, lithium-sodium as an amalgam, and lithium-sodium in a non-aqueous electrolyte, the anode consisting of from 1.0 weight percent to 99.0 weight percent lithium and the balance being sodium, a cathode positioned within the casing, the cathode functioning with an anode selected from the class consisting of lithium-sodium, lithium-sodium as an amalgam, and lithium-sodium in a non-aqueous electrolyte, and a solid sodium beta-alumina ion-conductive electrolyte, and a solid sodium beta-alumina ion-conductive electrolyte positioned within the casing between the anode and cathode and in contact with both the anode and cathode.

4,012,564

ELECTROCHEMICAL CELLS HAVING AN ELECTROLYTIC SOLUTION COMPRISING A COVALENT INORGANIC OXYHALIDE SOLVENT

James J. Auborn, Groton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 385,127, Aug. 2, 1973, Pat. No. 3,926,669, which is a continuation-in-part of Ser. Nos. 305,811, Nov. 13, 1972, abandoned, and Ser. No. 305,812, Nov. 13, 1972, abandoned. This application Sept. 26, 1975, Ser. No. 617,124
The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.
Int. Cl.² H01M 6/14
U.S. Cl. 429—194 19 Claims

1. An electrochemical cell consisting essentially of an oxidizable active anode material; a solid, non-consumable, electrically conducting, inert cathode current collector selected from the group consisting of the alkaline earth metals, the Group III A metals, the Group IV A metals, the Group V A metals, the transition metals, the rare earth metals, and semiconductors; said anode material being more electropositive than said cathode current collector and thus said anode material is oxidized during operation of said cell; and an electrolytic solution consisting essentially of a liquid, electrochemically reducible, covalent inorganic oxyhalide or thiohalide solvent and a solute dissolved therein, said inorganic solvent being free of sulfur dioxide; said inorganic solvent being electrochemically reduced upon the surface of said cathode current collector, whereby said inorganic solvent in conjunction with said oxidizable anode material serves as a source of electrical energy during operation of said cell.

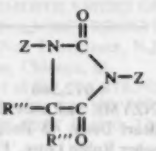
4,012,565

PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING AN N-HALO HYDANTOIN

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 582,507, May 30, 1975, Pat. No. 3,968,095, which is a division of Ser. No. 453,911, March 22, 1974, Pat. No. 3,932,352. This application Apr. 2, 1976, Ser. No. 672,908
Int. Cl.² C08J 3/20
U.S. Cl. 526—6 3 Claims

1. A photodegradable composition comprising a polyolefin and about from 0.1 to 10%, based on the weight of polyolefin, of an additive of the structure



wherein one of the Z's is chlorine, bromine, or iodine, and the other Z is hydrogen, chlorine, bromine, or iodine, and each R''' is hydrogen or a lower alkyl radical.

4,012,566

METHOD FOR MODIFYING THE PROPERTIES OF RUBBERY POLYMERS OF CONJUGATED DIENES

Robert P. Zelinski, Bartlesville, Okla., and Rudolph H. Gath, Eilenburgerweg, Germany, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 72,904, Sept. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 689,335, Dec. 11, 1967, abandoned. This application Mar. 10, 1975, Ser. No. 557,157
Int. Cl.² C08F 8/42
U.S. Cl. 526—48 33 Claims

1. A process to decrease the cold flow of a conjugated diene polymer wherein said conjugated diene polymer is a homopolymer or copolymer of a conjugated diene or of a conjugated diene with a monomer containing a vinylidene group, which process comprises contacting said conjugated diene polymer with a homogeneous olefin disproportionation catalyst, wherein said catalyst is an admixture of (a) an NO-containing transition metal complex represented by the formula $[L_a(NO)_bM_cZ_d]_x$ and (b) an aluminum-containing component,

wherein in said (a) L is a ligand; M is a transition metal selected from Group VIB, VIIB, and the iron and cobalt subgroups of Group VIII; Z is a halide, CN, SCN, OCN, or $SnCl_3$; a and d are numbers 0 to 6; b is 1 or 2; c is 1 to 4; and x is a number indicative of the polymeric state of the complex; and

wherein said (b) aluminum-containing component is (1) represented by the formula $RAlX_2$; (2) a mixture of (1) and a compound represented by the formula R_nAlX_m wherein R is an aromatic or saturated aliphatic radical, including radicals substituted with halo groups or alkoxy groups, and having up to about 20 carbon atoms, X is halogen, n is 2 or 3, m is 0 or 1 and the sum of n and m is 3; or (3) a compound represented by the formula R_nAlX_m wherein R, X, n and m are as defined herein, and

wherein the ratio of (b):(a) and the conditions of said contacting including temperature, pressure, and time, are effective to decrease said cold flow of said conjugated diene polymer.

4,012,567
TITANATE ESTER CURE OF UNSATURATED ELASTOMERS
Frederick C. Loveless, Cheshire, Conn., assignor to Uniroyal Inc., New York, N.Y.
Filed Mar. 12, 1975, Ser. No. 557,712
Int. Cl.² C08F 8/43, 8/14
U.S. Cl. 526—48 14 Claims

1. A method of curing an unsaturated elastomer consisting essentially of mixing 100 parts by weight of the said elastomer with from 1 to 10 parts by weight of an organo titanate ester, the resulting mixture being substantially anhydrous and containing less than one mole of non-volatile organic hydroxy compound per mole of titanate ester, and exposing the resulting mixture to the atmosphere, whereby the unsaturated elastomer becomes cured by the action of the said organo titanate ester.

4,012,568
ENZYME SEPARATION
Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England
Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.
This application Sept. 2, 1975, Ser. No. 609,419
Claims priority, application United Kingdom, Feb. 11, 1971, 3469/71
Int. Cl.² C08F 120/052
U.S. Cl. 526—50 9 Claims

1. A reactive matrix consisting essentially of nicotinamide adenine dinucleotide phosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said nicotinamide adenine dinucleotide phosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said nicotinamide adenine dinucleotide phosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,569
ENZYME SEPARATION
Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England
Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.
This application Sept. 2, 1975, Ser. No. 609,420
Claims priority, application United Kingdom, Feb. 11, 1971, 3469/71
Int. Cl.² C08F 120/052
U.S. Cl. 526—50 9 Claims

1. A reactive matrix consisting essentially of a reduced form of nicotinamide adenine dinucleotide phosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said reduced form of nicotinamide adenine dinucleotide phosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said reduced form of nicotinamide adenine dinucleotide phosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,570
ENZYME SEPARATION
Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight,' 238 Windsor Road, Maidenhead, Berkshire, both of England
Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.
This application Sept. 4, 1975, Ser. No. 610,151
Int. Cl.² C08F 120/052
U.S. Cl. 526—50 9 Claims

1. A reactive matrix consisting essentially of adenosine diphosphate ribose chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said adenosine diphosphate ribose attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said adenosine diphosphate ribose, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,571
ENZYME SEPARATION
Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England
Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.
This application Sept. 4, 1975, Ser. No. 610,153
Claims priority, application United Kingdom, Feb. 11, 1971, 4469/71
Int. Cl.² C08F 120/052
U.S. Cl. 526—50 9 Claims

1. A reactive matrix consisting essentially of adenosine monophosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said adenosine monophosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said adenosine monophosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,572
ENZYME SEPARATION
Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England
Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.
This application Sept. 4, 1975, Ser. No. 610,154
Claims priority, application United Kingdom, Feb. 11, 1971, 4469/71
Int. Cl.² C08F 120/052
U.S. Cl. 526—50 9 Claims

1. A reactive matrix consisting essentially of adenosine diphosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said adenosine diphosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said adenosine diphosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,573
METHOD OF REMOVING HEAT FROM POLYMERIZATION REACTIONS OF MONOMERS IN THE GAS PHASE

Hans-Georg Trieschmann, Hambach; Karl-Heinz Ambil, Ludwigshafen; Wolfgang Rau, Heidelberg, and Karl Wisseroth, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 349,213, April 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 186,348, Oct. 4, 1971. This application Oct. 16, 1975, Ser. No. 623,019

Claims priority, application Germany, Oct. 9, 1970, 2049622

Int. Cl.² C08F *2/34, 10/00*

U.S. Cl. 526—68 **4 Claims**

1. In an improved method of removing heat from the polymerization reactions of monomers in the gas phase in which gaseous or liquid monomer optionally together with an inert liquid heat-transfer agent is introduced into the polymerization zone, pulverulent polymer is removed therefrom and gaseous monomer or gaseous inert heat-transfer agent, is removed from said polymerization zone, liquefied by cooling under the pressure prevailing in the polymerization zone and reintroduced in the liquid state into the polymerization zone, the improvement which comprises:

a. condensing and storing said monomer or heat-transfer agent outside the polymerization zone, while the temperature in the polymerization zone is kept constant by regulating the rate of reintroduction of the liquid monomer or heat-transfer agent into the polymerization zone;

b. mixing the liquid monomer or liquid heat-transfer agent with the pulverulent polymer within said polymerization zone, said liquid monomer or said liquid heat-transfer agent coming in direct contact with said pulverulent polymer before said monomer or said heat-transfer agent vaporizes;

c. controlling the rate of flow of the vaporized monomer or heat-transfer agent so that it does not exceed 10 cm/sec/;

d. maintaining the pressure and temperature in the polymerization zone being at such a level that the vaporized monomer or heat-transfer agent remains in the gaseous state;

e. stirring said pulverulent polymer in said polymerization zone with a stirrer having an output of from 10 to 35 watts/liter of pulverulent polymer; and

f. the mean circulation time of the polymer particles in the polymerization zone is maintained at from 30 to 100 seconds.

4,012,574
POLYMERIZATION PROCESS

Eric Jones, and John Walker, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 13, 1975, Ser. No. 540,702

Claims priority, application United Kingdom, Jan. 14, 1974, 1615/74

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—74 **7 Claims**

1. A process for the polymerization or copolymerization of olefins by dispersion polymerization of the said olefin or olefins in a non-polar liquid hydrocarbon diluent in the presence of a polymerization catalyst which comprises a transition metal composition which is the product of reacting a transition metal complex of general formula R_mMX_p with a substantially inert material having a hydroxylic surface which is free of adsorbed water, wherein M is a metal of Groups IVA to VIA of the Periodic Table, R is a hydrocarbon or substituted hydrocarbon group, X is a monovalent ligand and m and p are integers, m having a value from 2 to the highest valency of the metal M, and p having a value from 0, to 2 less than the prevailing valency of M in the complex, and in the presence of a surface-active compound containing one or more terminal aliphatic perfluoro carbon groups containing at least three carbon atoms, selected from branched and straight chain perfluoro alkyl and perfluoro alkenyl groups and perfluoro alkyl chains, and one or more hydrophilic groups selected from oxyalkylene chains and carboxyl groups, the surface-active compound being present in a concentration in the range 0.05 to 25 ppm based on the volume of hydrocarbon diluent.

4,012,575
HOMOPOLYMERS OF CIS-5-NORBORNENE-2,3-DICARBOXYLIC ANHYDRIDES

Norman G. Gaylord, New Providence, N.J., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 470,705, May 16, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 573,194

Int. Cl.² C08F *134/00, 234/00*

U.S. Cl. 526—271 **9 Claims**

1. A process for the preparation of homopolymers of cyclic adducts derived from maleic anhydride and a cyclic conjugated diene, said diene selected from the group consisting of cyclopentadiene and methyl cyclopentadiene which comprises heating said adduct at a temperature at which endo-exo isomerization does not occur during the reaction period, said temperature being not less than 50° C., and adding thereto a free radical precursor having a half life of no more than 2 hours.

4,012,576
ANTIBIOTIC COMPLEX BU 2183

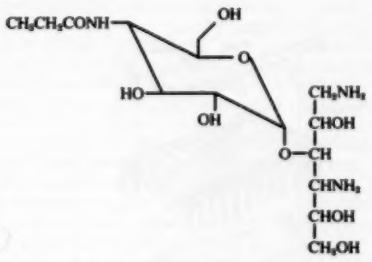
Hiroshi Kawaguchi, Tokyo; Koji Tomita, Kawasaki; Kei-Ichi Fujisawa, Kamifukuoka, and Hiroshi Tsukiura, Mitaka, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 532,137, Dec. 12, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,391

Int. Cl.² A61K *35/00;* **C07H** *15/22*

U.S. Cl. 536—17 **8 Claims**

1. The antibiotic Bu-2183 A of the formula



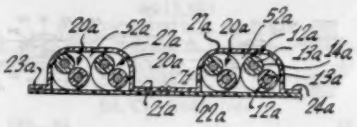
or a pharmaceutically acceptable acid addition salt thereof.

4,012,577

MULTIPLE TWISTED PAIR MULTI-CONDUCTOR LAMINATED CABLE

Roger J. Lang, Garden Grove, and Lawrence J. Bockhold, Whittier, both of Calif., assignors to Spectra-Strip Corporation, Garden Grove, Calif.

Filed Apr. 30, 1975, Ser. No. 573,350
Int. Cl.² H01B 7/08
U.S. Cl. 174—27 10 Claims



1. A multi-conductor cable which comprises:

a first and second plastic film bonded together to form a) a plurality of spaced encapsulating ducts and b) nip areas extending laterally between and joining each of said encapsulating ducts;

a plurality of groups of round, insulated, conductor twisted pairs, each said group consisting of at least two twisted pairs of said round, insulated, conductors and each of said twisted pairs in each said group lying in side to side contiguous relationship with another of said twisted pairs in said group;

each of said spaced encapsulating ducts containing one of said groups of insulated round conductor twisted pairs, said encapsulating ducts and said nip areas coacting as alignment means for said groups of round insulated conductor twisted pairs; and

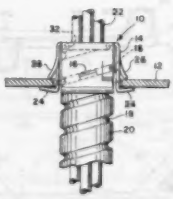
a plurality of longitudinally extending cavities, at least one cavity being formed within each of said encapsulating ducts and being defined by an overlying portion of each encapsulating duct and any two of said round insulated twisted conductor pairs contained within each said duct, each of said cavities providing a means for easy entry of a severing tool into each said duct.

4,012,578

ONE PIECE CONNECTOR FOR FLEXIBLE CONDUIT

Thomas M. Moran, Cleveland, and Joseph H. Paskert, Lakewood, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed July 2, 1975, Ser. No. 592,587
Int. Cl.² H02G 3/06
U.S. Cl. 174—51 29 Claims



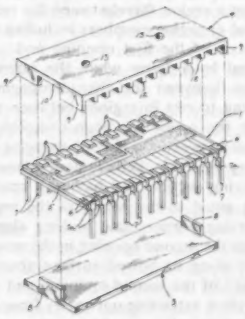
20. A one-piece, self-retaining metal clip for use in connecting an electrical conduit having a helically grooved outer metal covering and electrical wires therein within a generally round aperture in a junction box or the like, said one-piece metal clip being adapted to extend through said aperture in a wall portion of said junction box, said one-piece metal clip comprising a body portion defined by generally flat walls for extending through said aperture in said junction box, said body portion having a first opening at one end thereof for receipt of said electrical wires and a second opening at the other end thereof for receipt of said electrical conduit, flange means at said other end of said body portion for engaging the outer surface of said junction box, said flange means comprising deflectable portions which are attached to and extend transversely outwardly from the generally flat walls defining said body portion and which have surface portions for engagement with said outer surface of said junction box upon insertion of said one-piece metal clip into said aperture in said wall portion of said junction box, retaining arms formed in at least two of said walls defining said body portion, each of said retaining arms projecting outwardly for a portion of the axial length of said walls defining said body portion and being resiliently deflectable radially inwardly upon insertion of said body portion through said aperture in said junction box and springing outwardly upon passing through said aperture so as to engage the inner surface of said junction box, said retaining arms, in an undeformed position, being separated from said flange means by an axial distance less than the thickness of said wall portion of said junction box permitting said one-piece metal clip to be resiliently clamped to said junction box by said flange means and said retaining arms so as to positively electrically ground said one-piece metal clip to said junction box, at least two of said walls defining said body portion also having an inwardly extending tab formed therein, said tabs extending transversely toward the central axis of said body portion and having an inner elongated edge, said tabs being located at axially and circumferentially offset locations on said body portion permitting said inner elongated edges to be disposed along a helix of the same pitch as the helical groove in the metal covering to threadably connect said metal covering with said body portion, said tabs being spaced from said flange means toward said one end of said body portion causing said tabs to be disposed within said junction box when said electrical conduit is connected to said junction box, and collar means connected to said one end of said body portion to shield said electrical wires from engagement with any burrs which may be present on the outer end portion of said electrical conduit, said collar means including a rim portion disposable within said electrical conduit in a telescopic relationship with said outer end portion of said electrical conduit.

4,012,579

ENCAPSULATED MICROCIRCUIT PACKAGE AND METHOD FOR ASSEMBLY THEREOF

Donald J. Fox, Wauwatosa, and Thomas M. Schuster, Waukesha, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 21, 1975, Ser. No. 551,762
Int. Cl.² H05K 5/00
U.S. Cl. 174—52 PE 15 Claims



1. An encapsulated microcircuit, comprising:

a housing having bottom and top cover portions, one of the cover portions having a projecting member thereon and the other cover portion having a recess therein which mates with the projecting member;

a substrate having a microcircuit thereon, a plurality of

terminals disposed on a side thereof, and an end abutting the projecting member and which is disposed between the bottom and top cover portions;

means for bonding the substrate to the upper surface of the bottom cover portion; and

a compound which is disposed between the top and bottom cover portions and encapsulates the microcircuit therebetween.

4,012,580

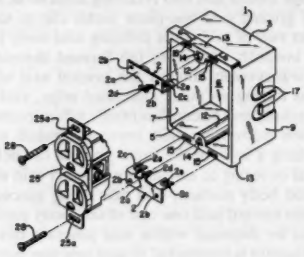
ELECTRICAL WIRING BOX

William O. Arnold, Parkersburg, W. Va., assignor to Union Insulating Company, Parkersburg, W. Va.

Filed Oct. 14, 1975, Ser. No. 621,688

Int. Cl.² H02G 3/08

U.S. Cl. 174—53 **11 Claims**



1. A box arrangement comprising.

a box including a plurality of walls arranged to define a space for receiving a device in said space, said box further including a mounting portion extending generally transversely from one of the walls of the box and having a first surface and a second surface and first and second openings spaced from each other with the second opening extending through the mounting portion from the first surface to the second surface, said second opening having a predetermined height in the direction of the mounting portion and being surrounded by the material of the mounting portion; and a mounting member comprising:

a screw-receiving section disposed within the first opening in the mounting portion, said screw-receiving section including a plurality of thread-engaging members disposed along the axis of the first opening and arranged to define a region therebetween for receiving a screw, said thread-engaging members including tabs directed toward the axis of the first opening and capable of being deflected by a screw when the screw is forced into the region between the thread-engaging members and of coming to rest in regions between threads of the screw when the screw has been completely inserted into the region between the thread-engaging members;

a unitary bowed locked element connected with the screw-receiving section and having a maximum height essentially equal to the height of the second opening in the mounting portion, said locking element being disposed within the second opening in the mounting portion with a point along its bowed surface abutting against an edge surface of the second opening; and

a projection extending outwardly from the bowed surface of the locking element at an acute angle and having a free end, said projection being outside of the second opening in the mounting portion with the free end thereof abutting angularly against the second surface of the mounting portion along a line generally transverse to the aforesaid one of the walls of the box following the insertion of the locking element into the second opening, said free end of the projection facing in a direction toward the first and second surfaces of the mounting portion.

4,012,581

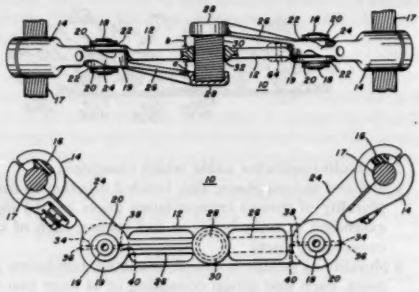
FRAME-TYPE DAMPING SPACER

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 5, 1976, Ser. No. 664,087

Int. Cl.² H02G 7/14, 7/12

U.S. Cl. 174—42 **17 Claims**



17. A damping spacer having a body member, a plurality of conductor clamping members and pivot means respectively pivotally attaching the clamping members to said body member at respective spaced locations thereon, with at least two of the clamping members having respective arm portions located opposite each other, and resilient damping means resiliently connecting the respective opposite arm portions together, the damping means having a longitudinal axis extending through the body member.

4,012,582

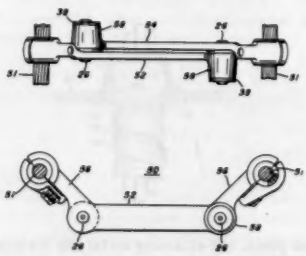
DAMPING SPACERS FOR CONDUCTOR BUNDLES

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 626,975, Oct. 29, 1975, Pat. No. 3,971,881. This application Mar. 29, 1976, Ser. No. 671,360

Int. Cl.² H02G 7/14, 7/12

U.S. Cl. 174—42 **3 Claims**



1. A frameless damping spacer for spacing at least two, parallel, overhead conductors, the damping spacer comprising at least two, rigid, spacer arms and conductor clamping members, said clamping members being respectively located adjacent one end of each of the spacer arms, an integral housing provided adjacent the other end of each spacer arm, an opening provided in each arm near the clamping member, and, an opening extending through each housing, said spacer arms

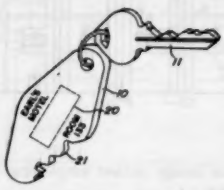
being disposed together such that the opening in the housing and the opening near the clamping member of one arm are respectively aligned with the opening near the clamping member and the opening provided in the housing of the other arm, rigid pins extending respectively through the aligned openings in the arms, and a damping mechanism located in the opening of at least one of the housings and mechanically associated with the housing and the pin associated therewith.

4,012,583

PAY TV CONTROL SYSTEM

Dennis A. Kramer, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1975, Ser. No. 555,010
Int. Cl.² H04N *1/44*
U.S. Cl. 358—84 **10 Claims**



1. In a television receiving system wherein access to certain special channels is controlled, control apparatus comprising:

activating means including mechanical key means and a validatable portion, said portion being adapted to being cancelled; and

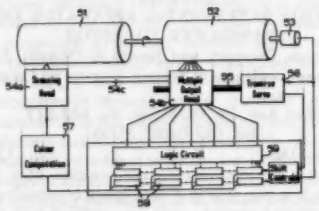
enabling means including circuitry for controlling access to the special channels, locking means adapted to be unlocked by the key means, sensing means for sensing the presence of a validated portion of the activating means, and cancellation means for cancelling the validation of the validatable portion of the activating means.

4,012,584

APPARATUS FOR MAKING A SCREEN REPRODUCTION OF AN IMAGE

Richard M. Gascoigne, Esher, England, assignor to Crosfield Electronics Limited, London, England

Filed Jan. 29, 1975, Ser. No. 545,179
Claims priority, application United Kingdom, Jan. 30, 1974, 4250/74
Int. Cl.² H04N *5/86*; G11B *7/08*
U.S. Cl. 358—302 **8 Claims**



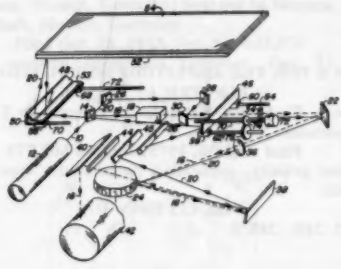
1. Apparatus for making a screen reproduction of an image, including a row of light source elements for exposing, in combination, a line across a component screen area of a sheet or plate to be exposed, and an electronic screened-image signal generator operative under the effect of an image-representing signal to control the illumination of the light source elements, the screened-image signal generator comprising a pair of shift register devices, each storage location in one shift register device having a corresponding storage location in the other shift register device, means for moving trains of logic signals along the two shift register devices in opposite directions, means responsive to an image-representing signal to vary the length of the trains of local signals in the shift register devices, means responsive to the coincidence of logic signals in corresponding storage locations in the two shift register devices to develop a screened-image signal for that pair of locations, means for achieving relative movement between the said light source elements on the one hand and the sheet or plate on the other hand along successive scan lines in a direction at an angle to the said line across the component screen area, in synchronism with the movement of the trains of logic signals along the two shift register devices, and means for applying resultant screened-image signals to the said light source elements during such relative movement whereby the component screen area of the sheet or plate is exposed scan line by scan line.

4,012,585

INPUT AND OUTPUT FLYING SPOT SCANNING SYSTEM

Philip L. Chen, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 3, 1975, Ser. No. 546,478
Int. Cl.² H04N *5/84, 3/08*
U.S. Cl. 358—285 **7 Claims**



1. In a flying spot scanning system: an illumination source generating a collimated beam, a beam splitter in the path of the collimated beam permitting a portion of the collimated beam to pass therethrough and redirecting another portion of the collimated beam, a modulator located between said beam splitter and a rotatable polygon scanner in the path of one of said beam portions to modulate the same to provide a modulated beam, the other of said beam portions being an unmodulated beam, an imaging station, a reading station, means for directing each said beam along separate paths to said polygon and including a first cylinder lens and an imaging lens optically located between said polygon and said first cylinder lens, said first cylinder lens and said imaging lens being located in the path of each of said beams, said first cylinder lens being optically located between said beam splitter and said polygon, the width of each beam in the direction of scan at the polygon being substantially the same, said beams being aligned on said polygon in a direction parallel to the axis of rotation, said directing means directing said beams to said polygon along such paths that said beams will reflect from said polygon along separate paths, said imaging station being in the path of the modulated beam reflected from said polygon, a second cylinder lens being optically located between said polygon and said imaging station in the path of said modulated beam, said reading station being in the path of the unmodulated beam reflected from said polygon, a first mirror optically located between said polygon and said reading station, a second mirror optically located between said first mirror and said reading station, said first mirror being in the path of said scanned unmodulated beam, said first mirror reflecting said unmodu-

lated beam to said second mirror, said second mirror reflecting said unmodulated beam to said reading station, each of said mirrors extending across said reading station in the direction of beam scan whereby the unmodulated beam will be scanned across said document station in an X direction, means mounting said first and second mirrors for movement in a Y direction transverse to said X direction, means for simultaneously moving said second mirror in said Y direction across substantially the full length of said document station and for moving said first mirror in the same direction as said second mirror is moved a distance substantially less than the distance said second mirror is moved, the relative distance of and the relative rate of movement of said mirrors being such to maintain the unmodulated beam length between said polygon and said reading station substantially constant, and means for detecting reflection of said unmodulated beam from said reading station, a third cylinder lens optically located between said reading station and said polygon in the path of said scanned unmodulated beam, said first cylinder lens having its power plane in a plane generally perpendicular to the axis of rotation of said polygon, said second and third cylinder lenses each having its power plane in a plane generally parallel to the axis of rotation of said polygon and each being equally optically spaced from said imaging lens.

4,012,586

DEVICE FOR THE AMPLITUDE MODULATION OF AN ELECTRICAL SIGNAL

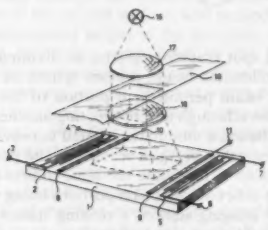
Jan Roos, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1975, Ser. No. 607,771

Claims priority, application Netherlands, Sept. 2, 1974, 7411606

Int. Cl.² H04N 3/14

U.S. Cl. 358—285 **14 Claims**



1. A device for the amplitude-modulation of an electrical signal, comprising a wafer of a piezoelectric material, a first transducer coupled to the wafer for converting the electrical signal into a Bleustein-Gulyaev acoustic surface wave, a second transducer coupled to the wafer at a point spaced apart from the first transducer for converting surface waves into electric signals, free charge carriers being located within the range of influence of the electric field associated with the surface wave, the material on which the surface wave propagates being a semi-conductor material, and means for applying an electric drift field parallel to the direction of propagation of the surface wave, the drift field comprising at least two components, one component with a field strength at which the concentration of free charge carriers does not influence the gain or attenuation of the surface wave, and a pulsating component, which is either zero or has such as value that the gain or attenuation of the surface wave under the influence of the sum of the two components is dependent on the concentration of free charge carriers.

4,012,587

SOLID STATE IMAGE SENSOR

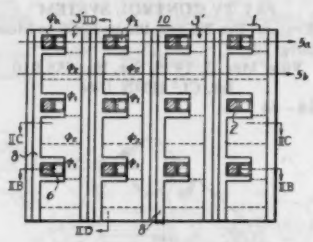
Shigeyuki Ochi, Machida; Seisuke Yamanaka, Mitaka, and Yasuo Kanou, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1976, Ser. No. 652,116

Claims priority, application Japan, Jan. 30, 1975, 50-12740

Int. Cl.² H04N 3/16

U.S. Cl. 358—213 **10 Claims**



1. A solid state image sensor employing charge transfer devices comprising:

a. a plurality of image pickup portions aligned in two dimensions in areas of a semiconductor body, each image pickup portion having an image storing area and a transfer gate area;

b. a plurality of vertical shift registers extending adjacent said image pickup portions in the vertical direction, each vertical shift register having a plurality of electrode sets having enlarged portions which lie between said image pickup portions relative to the vertical direction; and

c. a horizontal register for receiving collected light information from said plurality of vertical shift registers in parallel and for supplying the light information in a serial form to an output.

4,012,588

POSITION DETERMINING APPARATUS AND TRANSDUCER THEREFOR

Robert L. Davis, Prospect, and Joseph A. Howells, Danbury, both of Conn., assignors to Science Accessories Corporation, Southport, Conn.

Filed Aug. 29, 1975, Ser. No. 608,917

Int. Cl.² G08C 21/00

U.S. Cl. 178—18 **12 Claims**

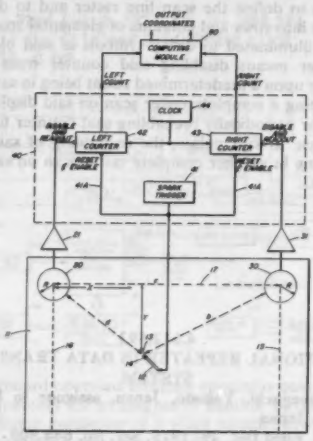
1. Apparatus for determining the position of a movable element which is movable in a data space comprising:

first and second spaced receivers, each of said receivers comprising a curved shell of piezoelectric material having a conductive coating thereon and resilient conductive means coupled across the inner and outer surfaces of said shell;

source means for periodically generating sound waves for travel through air between said movable element and said first and second receivers;

timing means coupled to said receivers and synchronized with the generation of said sound waves for measuring the

transit time of said sound waves between said source and said recievers; and



computing means for translating the measured transit times to coordinates of the movable element.

4,012,589

SWITCHING ARRANGEMENT FOR TRANSMITTING DATA IN TIME DIVISION MULTIPLEX SYSTEMS

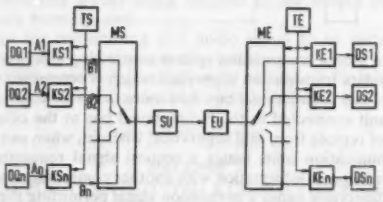
Konrad Reisinger, Zorneding, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 13, 1976, Ser. No. 658,120

Claims priority, application Germany, Mar. 20, 1975, 2512302

Int. Cl.² H04J 3/06

U.S. Cl. 178—50 **3 Claims**



1. A switching arrangement for the transmission of data in a time division multiplex (TDM) system on a character frame basis, which system includes a polarity reversal recognition circuit producing a polarity reversal signal and signaling polarity reversals of a data signal, a blocking circuit arrangement producing a stop signal blocking the polarity reversal recognition circuit throughout the duration of a predetermined number of m bits of the data signal and a clock generator producing a clock signal facilitating the sampling of the data signal, the switching arrangement comprising:

shift register means comprising at least a number $m+2$ cells and including parallel input terminals for receiving binary digits in parallel, serial input terminals for receiving binary digits in series and a clock pulse input terminal for receiving shift register clock pulses,

gate means having an input connected to receive said polarity reversal signal and another input connected to receive the output signal from the $m+2th$ cell of said shift register means and having an output terminal for emitting a phase position signal,

means for adjusting the phase position of said clock signal responsive to said phase position signal, said adjusted clock signal being coupled to said clock pulse input of said shift register means,

the $m+1th$ cell of said shift register means being connected to said polarity reversal recognition circuit to provide a stop signal for that circuit,

said phase position signal being coupled to at least two parallel input terminals of said shift register means and

means for applying to said serial input terminals of said shift register means binary digits differing from the binary digits of said phase position signal.

4,012,590

CIRCUIT ARRANGEMENT FOR TWO-WIRE FULL DUPLEX DATA TRANSMISSION

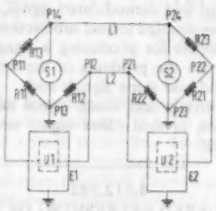
Adolf Haass, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 28, 1975, Ser. No. 625,870

Claims priority, application Germany, Oct. 31, 1974, 2451913

Int. Cl.² H04L 5/14

U.S. Cl. 178—58 R **6 Claims**



1. A circuit arrangement for two-wire, full duplex data transmission via two lines connecting at least two stations, wherein each said station comprises:

receiver means connected to a first terminal, to a second terminal which is connected to one of said two lines and to a reference potential,

transmitter means connected between a third terminal and said reference potential,

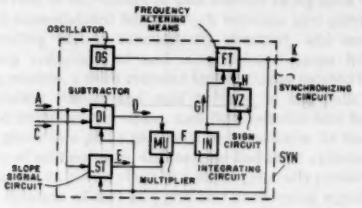
balancing resistance means connected between said first and third terminals, said third terminal being connected to the other of said two lines and

measuring means in said receiver means coupled to said first and second terminals so as to be responsive, respectively, to a first current flowing through said transmission means, said balancing resistance means, said first terminal and said receiver means to said reference potential and a second current flowing through said transmission means, said two lines, said second terminal and through said receiver means to said reference potential, said measuring means including means for generating a measuring signal for facilitating the reception of data, said measuring signal having a value indicating the difference between the values of said first and second currents if the algebraic signs of said first and second currents are the same and for indicating the sum of said first and second currents if the algebraic signs of said first and second currents are different.

4,012,591
CIRCUIT ARRANGEMENT FOR THE PHASE CONTROL OF A CLOCK SIGNAL

Heinrich Sailer, Munich, and Gero Schollmeier, Gauting, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 18, 1974, Ser. No. 480,564
Claims priority, application Germany, June 20, 1973, 2331601
Int. Cl.² H04L 7/00; H03K 9/00
U.S. Cl. 178—69.1 4 Claims



1. In a data transmission system wherein data signals are pulse amplitude modulated, transmitted, received, demodulated and applied to a data sink, apparatus for controlling the phase of a clock signal, comprising:

means for producing said clock signal,

subtraction means for receiving said data and demodulated signals and producing a difference signal having amplitudes which characterize the amplitude differences between said data and said demodulated signals at predetermined sampling instants,

means for generating a slope signal having a value indicative of the slope of said demodulated signal,

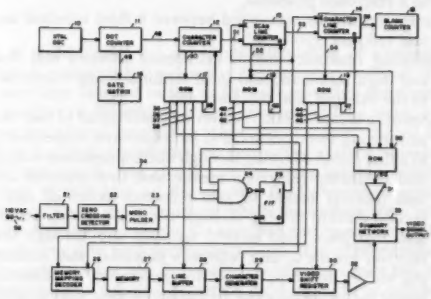
multiplier means coupled to said subtraction means and said generating means for producing a signal having amplitudes which are the products of the amplitudes of said difference and said slope signals and

means for receiving said clock signal and adjusting the phase position of said clock signal responsive to said product signal.

4,012,592
AC LINE TRIGGERED REFRESHING OF CRT DISPLAYS

Carl A. Ricard, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed May 9, 1975, Ser. No. 576,399
Int. Cl.² H04N 5/04; G08B 23/00
U.S. Cl. 358—150 10 Claims



1. A display system for displaying symbols on a display device that exhibits a scan-line raster, said display system including a circuit for controlling the generation of signals for the display of symbols in defined character block on said device comprising

means for generating a plurality of pulses,

means for counting said pulses,

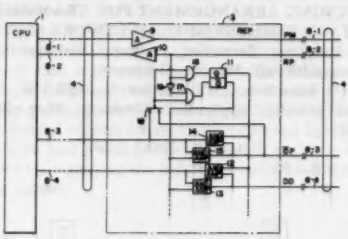
decoder means responsive to the count in said counting means to define the scan line raster and to divide said blocks into rows and columns of elemental spaces selectively illuminated to dislay symbols in said blocks, said decoder means disabling said counter from counting further upon a predetermined count being in said counter indicating a complete raster scan on said display device,

means for periodically reenabling said counter to count in response to said pulses, the reenabling of said counter resulting in another complete raster scan on said display device.

4,012,593
BIDIRECTIONAL REPEATER IN DATA TRANSMISSION SYSTEM

Taihei Yamaguchi, Yamato, Japan, assignor to Panafacom Limited, Japan

Filed Dec. 29, 1975, Ser. No. 644,509
Claims priority, application Japan, Dec. 29, 1974, 50-965
Int. Cl.² H04L 25/20
U.S. Cl. 178—71 R 8 Claims



1. In a data transmission system comprising a bidirectional bus, a data transmission supervisor which is connected to one end of said bidirectional bus, and more than one communication unit connected to the bidirectional bus at the other end thereof remote from said supervisor; wherein, when one of the communication units issues a request signal requesting the transmission of information with another communication unit, said supervisor issues a permission signal permitting the occupation of said bidirectional bus, and wherein said one communication unit thereupon transmits a response signal to said supervisor and then starts the transmission of information, a repeater disposed in said bidirectional bus between said one end and said other end thereof, said repeater comprising:

first communication information transfer means for transferring communication information along the bidirectional bus from said one end to the other end;

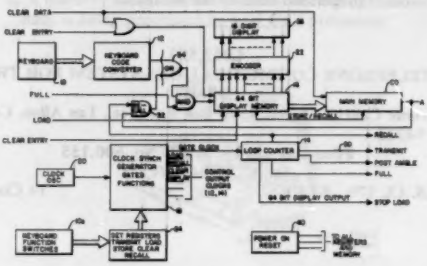
second communication information transfer means for transferring communication information along the bidirectional bus from said other end to the one end; and

transmitting direction switching means coupled to said communication units and operatively associated with said first and second communication information transfer means for normally actuating the first communication information transfer means to permit communication from said one end to said other end and, upon detection of the response signal from the communication unit connected to the bus on said other end, for stopping the actuation of the first communication information transfer means and for actuating the second communication information means to permit communication from said other end to said one end.

4,012,594
KEYBOARD OPERATED TERMINAL APPARATUS

Emanuel Marvin Paller, 20200 Marilla Court, Saratoga, Calif. 95070

Filed Aug. 6, 1974, Ser. No. 495,254
Int. Cl.² G06F 3/14; H04M 11/06
U.S. Cl. 179—2 DP 8 Claims

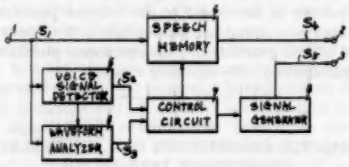


1. A keyboard operated terminal apparatus comprising:
a main memory for storing an N number of data frames, each frame consisting of a given number of characters, each character consisting of a finite number of data bits;
a display memory for storing a selected one frame of said N number of data frames;
said data frames being stored statically in said main memory and display memory when the keyboard is not operated;
means including the keyboard for entering characters of data into said display memory;
means for entering a frame of data into said main memory;
means for shifting N-1 frames of data from said main memory and for recalling a selected frame of data for storage in said display memory;
means for displaying a frame of data statically stored in said display memory;
means for converting said N number of data frames stored statically in said main memory to an audio signal, said converting means being coupled to the output of said main memory; and
means for transmitting said audio signal to an apparatus other than said terminal apparatus;
said display memory, main memory and means for recalling being coupled in a closed feedback loop.

4,012,595
SYSTEM FOR TRANSMITTING A CODED VOICE SIGNAL

Chuichi Ota, Tokyo, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed June 12, 1974, Ser. No. 478,768
Claims priority, application Japan, June 15, 1973, 48-66950
Int. Cl.² H04J 5/00
U.S. Cl. 179—15 AS 4 Claims

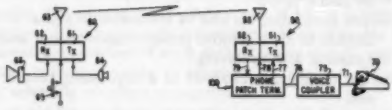


1. A system for transmitting a coded voice signal, comprising: input terminal means for receiving a train of code units representative of the coded voice signal obtained by sampling at sampling intervals and encoding an original voice signal; speech memory connected to the input terminal means for successively storing the train of code units; detector means connected to the input terminal means for digitally detecting from the code units when the original voice signal exceeds a predetermined threshold level; waveform analyzer means connected to the input terminal means and the detector means for measuring the short-time frequency of the original voice signal from the train of code units, at constant intervals during a period where the detector means detects the coded voice signal; control means connected to the detector means, the waveform analyzer means and the speech memory for generating control outputs to selectively read-out the code units from the speech memory so that the transmission intervals of the read-out code units correspond to the short-time frequency of the original voice signal measured by the waveform analyzer; signal generator means connected to the control means for generating a control signal respresentative of the transmission intervals; first output terminal means connected to the speech memory for sending out the read-out code units to a transmission line; and second output terminal means connected to the signal generator means for sending out the control signal to a transmission line.

4,012,596
TELEPHONE PATCH

William L. West, Jr., Lexington, Nebr., and William Sherman, III, Willingboro, N.J., assignors to Reach Electronics Inc., Lexington, Nebr.

Filed Aug. 6, 1975, Ser. No. 602,377
Int. Cl.² H04M 5/08
U.S. Cl. 179—41 A 34 Claims

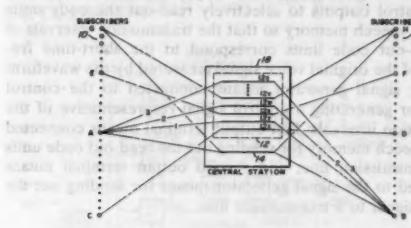


1. Apparatus for interconnecting a wire telephone line with a simplex radio system including a radio receiver having an audio output and a radio transmitter having an audio input, said apparatus comprising receiver switch means operable between a normal open condition disconnecting the receiver audio output from the telephone line and a closed condition connecting the receiver audio output to the telephone line, receiver control means coupled to said receiver switch means for controlling the operation thereof between the open and closed conditions thereof, receiver amplifying means coupled to said receiver control means and to the receiver audio output for generating a first control signal from the unrectified A.C. audio signals from the receiver and applying such control signal directly to said receiver control means with a time delay of not greater than about five milliseconds, said receiver control means being responsive to the first control signal for closing said receiver switch means for the duration of the first control signal to couple the A.C. audio signals to the telephone line, transmitter switch means operable between a normal open condition disconnecting the telephone line from the transmitter audio input and a closed condition connecting the telephone line to the transmitter audio input, transmitter control means coupled to said transmitter switch means for controlling the operation thereof between the open and closed conditions thereof, and transmitter amplifying means coupled to said transmitter control means and to the telephone line for generating a second control signal from the unrectified A.C. audio signals from the telephone line and applying such control signal directly to said transmitter control means with a time delay of not greater than about five milliseconds, said transmitter control means being responsive to the second control signal for closing said tramsmitter switch means for the duration of the second control signal to couple the telephone line A.C. audio signals to the transmitter.

4,012,597
TRANSMISSION TRUNK MULTICHANNEL DISPATCH SYSTEM WITH PRIORITY QUEUING

Charles Nelson Lynk, Jr., Arlington Heights, and James Joseph Mikulski, Deerfield, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 24, 1975, Ser. No. 634,962
Int. Cl.² H04Q 7/00
U.S. Cl. 179—41 A **40 Claims**



1. Control apparatus in a communication system having a central control station for assigning a limited number of information channels to a plurality of remote stations, each of said remote stations communicating a message, comprising a plurality of individual transmissions, on its assigned channel, the apparatus comprising:

each remote station having

means to request a channel assignment from the central station;

means responsive to an assigned channel signal to operate on said channel;

means generating an end of transmission signal at the conclusion of each remote station transmission; and

the central station having

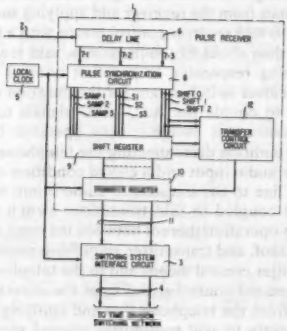
means to assign a channel to a requesting remote station; and

means detecting the end of transmission signal from a remote station and truncating said remote station's channel assignment in response thereto.

4,012,598
METHOD AND MEANS FOR PULSE RECEIVER SYNCHRONIZATION

Paul Ronald Wiley, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 14, 1976, Ser. No. 649,045
Int. Cl.² H04L 7/08
U.S. Cl. 178—69.1 **24 Claims**



1. A method of synchronizing the reception of serial pulses of a pulse stream, comprising the steps of

generating binary sequences representing multiple samples of received pulses,

using the sequences to control the selection of ones of the samples having a predetermined phase relationship to the pulse stream,

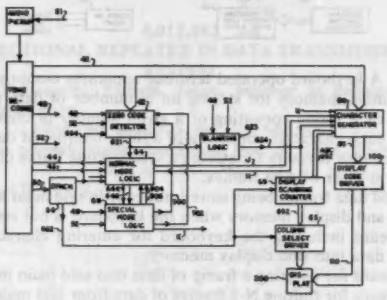
analyzing successive sequences to determine when the pulses have drifted with respect to the selected samples, and

compensating for the drift by controlling the selection of other prescribed ones of the samples.

4,012,599
TELEPHONE COMMUNICATIONS SYSTEM FOR THE DEAF

Jerome Charles Meyer, 1512 Ben Roe Ave., Los Altos, Calif. 94022

Filed July 29, 1975, Ser. No. 600,155
Int. Cl.² H04M 11/06
U.S. Cl. 179—84 VF **14 Claims**



1. Apparatus for use in receiving messages transmitted by pushbutton tone signaling means having a plurality of alphabetic pushbutton and a plurality of non-alphabetic pushbuttons, the alphabetic pushbuttons each having a plurality of alphabetic character markings and the alphabetic and non-alphabetic pushbuttons each generating distinct tone signals in response to actuation of a selected pushbutton, comprising:

decoding means coupled to receive the distinct tone signals for producing distinct electrical signals corresponding to actuation of the selected pushbutton;

means coupled to receive the distinct electrical signals for producing an alphabetic character address signal in response to receiving a first signal corresponding to actuation of a non-alphabetic pushbutton followed by a second signal corresponding to actuation of an alphabetic pushbutton; and

display means coupled to receive the alphabetic character address signal for producing a visual display of an alphabetic character corresponding to a character marking of the plurality of alphabetic character markings of the actuated alphabetic pushbutton, the character marking having a similar relative position within the plurality of alphabetic character markings of the actuated alphabetic pushbutton as compared to the relative position of the actuated non-alphabetic pushbutton with respect to positions of said plurality of non-alphabetic pushbuttons on the pushbutton tone signaling means.

4,012,600
AUTOMATIC PUSHBUTTON DIAL SYSTEM FOR A SUBSCRIBER TELEPHONE

Walter D. Warren, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 565,315
Int. Cl.² H04M 1/51
U.S. Cl. 179—90 B **6 Claims**

1. A keyboard dial system for a telephone set comprising:

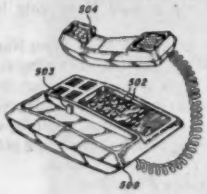
a. a digit processor having at least one set of input terminals

and at least one set of latched output terminals and including:

i. a programmed ROM containing a stored instruction set for controlling the operation of the dial system,

ii. an arithmetic/logic unit for performing arithmetic and logic operations on data according to said stored instruction set, and

iii. a memory means for temporarily storing data as such data is being processed by said digit processor;



b. a keyboard array having a plurality of keys selectively coupled to at least one of said input terminals and to a plurality of said output terminals for entering coded information into said digit processor in dependence upon the state of said keys; and

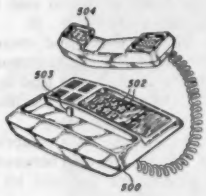
c. signal generator means coupled to at least one output terminal of said digit processor for generating dial signals corresponding to keyed in digits.

4,012,601

AUTOMATIC PUSHBUTTON DIAL ASSEMBLY FOR A SUBSCRIBER TELEPHONE

Engelbert W. Kehren, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 565,302
Int. Cl.² H04M *1/50, 1/42*
U.S. Cl. 179—90 K **7 Claims**



1. An automatic dial assembly for a telephone set comprising:

a. a bracket member having upper and lower major surfaces for mounting said automatic dial system in the telephone set;

b. a keyboard array having a plurality of keys, said array being mounted on the upper major surface of said bracket member and including a first set of terminal members selectively coupled to said array;

c. a circuit board mounted on the lower major surface of said bracket member, said circuit board including an integrated circuit digit processor having at least one set of input terminals and at least one set of output terminals, and signal generator means for generating dial signals mounted thereon, said circuit board including a second set of terminal members and a plurality of conductor members selectively coupling said second set of terminal members to the input terminals of said digit processor and selectively coupling at least one output terminal of said digit processor to said signal generator means; and

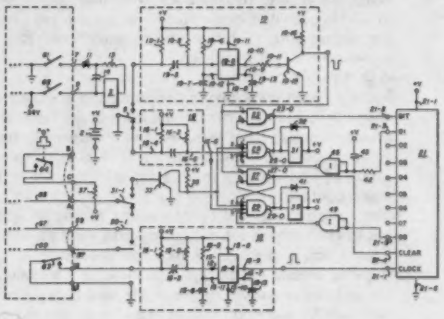
d. means selectively electrically coupling the first set of terminals on said keyboard array to the second set of terminals on said circuit board.

4,012,602

TOLL RESTRICTOR FOR TOUCH TYPE DIGIT SELECTOR

Joseph Monroe Jackson, Menlo Park, Calif., assignor to Litton Business Telephone Systems, Inc., Sunnyvale, Calif.

Filed Mar. 14, 1975, Ser. No. 558,302
Int. Cl.² H04M *1/66*
U.S. Cl. 179—90 D **1 Claim**



1. A toll call restrictor for a telephone substation of the type containing:

a hookswitch, said hookswitch having an on-hook condition when said station is not in use and an off-hook condition when said station is in use:

digit selecting means for sending of digit representative signals from station, said digit selecting means including a plurality of digit selecting switches, one of which is representative of the number 0, a common switch operable in response to operation of each digit selecting switch, and a contact means operable in response to that one of said digit selecting switches representative of the number 0, and an electrical circuit associated with said digit selecting means for enabling coupling of signals from said digit selecting means to a telephone line, the invention comprising:

an electronic shift register, said shift register having a clock input for receiving pulses to shift the position of an information bit contained within the register, a clear input for clearing any bit from the register, a bit input for receiving and inserting an information bit into the register, and a series of outputs including:

a first position output;

an *n*th position output, where n represents a number greater than two;

first and second Nand gate means, each of said Nand gate means having an output connected in circuit to an input of the other Nand gate to form a first Nand gate latch means, said latch means having a first and a second condition of latching;

and wherein said first Nand gate means contains two inputs and an output;

and wherein said second Nand gate means contains four inputs and an output;

and means connecting the output of said first Nand gate means to the first input of said second Nand gate means; means connecting the output of said second Nand gate means to the second input of said first Nand gate means to form said first Nand gate latch;

third and fourth Nand gate means, each of said Nand gate means having an output connected in circuit to an input of the other Nand gate means to form a second Nand gate latch means, said latch means having a first and a second condition of latching;

and wherein said third Nand gate means contains two inputs and an output;

and wherein said fourth Nand gate means contains four inputs and an output;

and means connecting the output of said third Nand gate means to the first input of said second Nand gate means and means connecting the output of said fourth Nand gate means to the second input of said third Nand gate means to form said second Nand gate latch;

first means coupled to said Nand gate latches for setting said first and said second Nand gate latch means from a first into a second condition in response to said hookswitch being placed into the off-hook condition and responsive to said hookswitch being placed in an on-hook condition for setting both said first and second Nand gate latch means to the first condition;

said first means comprising:

a first relay, said relay having a winding and a set of transfer contacts including, a break contact, a make contact and a transfer contact, said transfer contact normally being in contact with said break contact and responsive to energization of said winding for moving into contact with said make contact;

means for coupling said relay winding in circuit with said hookswitch means for energizing said winding when said hookswitch is in the off-hook condition;

first pulse means having an input coupled to said make contact and an output responsive to said contact between said transfer and said make contact for generating a pulse at an output;

second pulse means having an input coupled to said break contact and an ouput responsive to the restoration of contact between said transfer contact and said break contact upon de-energization of said relay winding for generating a pulse at an output;

second means connecting the output of said first Nand gate latch means to the bit input of said shift register for inserting an information bit in the first position of said register responsive to said first Nand gate latch means being in the second condition;

third means responsive to said second Nand gate latch means being in the second condition for enabling said electrical circuit of said digit selecting means and responsive to said second Nand gate latch means being in the first condition for disabling said electrical circuit of said digit selecting means;

fourth means coupled in circuit with said clock input for providing an input pulse to said clock input responsive to each operation of said common switch in said digit selecting means to thereby shift any bit in said shift register a corresponding number of positions, representative of a count of digits;

fifth means responsive to an output at said first output of said shift register for setting said first Nand gate latch means in the first condition;

said fifth means comprising further:

an inverter having an input and an output;

means coupling the inverter input in circuit with the first position output of said shift register;

means coupling the inverter output in circuit with said fourth input of said second Nand gate means;

sixth means coupled to said second Nand gate latch means and to said nth position output of said first register for setting said second Nand gate latch means into the first condition in response to an output at said nth position output of said shift register;

said sixth means comprising further:

an inverter having an input and an output;

means coupling the inverter input in circuit with said nth position ouput of said shift register;

means coupling the inverter output in circuit with the fourth input of said fourth Nand gate means;

seventh means coupled to the output of said second Nand gate latch means for providing a signal to said clear input of said shift register in response to said second Nand gate latch means being placed in the first condition, whereby said shift register is cleared;

said seventh means comprising further:

electrical lead means connected between said output of said third Nand gate means and said shift register clear input;

eighth means responsive to a predetermined voltage at an input for setting both said first and second Nand gate latches to said respective first condition;

said eighth means comprising:

transistor switch means having an input and an output and electrical lead means connecting said input to a make contact of a second relay in a ninth means and electrical lead means connecting said transistor output for resetting said first and second Nand gate latches into the first condition;

ninth means responsive to said first Nand gate latch being in the second condition for coupling said first switch means input in circuit with said contact means associated with said "zero" switch while said first Nand gate latch means is in the second condition, whereby operation of said "0" digit selecting switch thereduring places a predetermined voltage at said contact means;

said ninth means comprising:

a second relay, said realy having a winding and a transfer contact and a make contact and responsive to energization of said winding for placing said transfer contact in contact with said make contact;

means connecting said winding of said relay means in circuit with the output of said first Nand gate latch, whereby when said Nand gate latch is in the second condition, said relay winding is energized;

electrical lead means coupling one of said relay contacts in circuit with said zero switch of said digit selecting means, whereby if zero is the first dialed digit, successive digits cannot be sent from the telephone set;

and wherein said first pulse means of said first means is coupled at an output to said Nand gate latches via electrical lead means connected to said first input of said first Nand gate means and to said first input of said third Nand gate means;

and wherein said second pulse means of said first means is coupled at an output to said Nand gate latches via electrical lead means connected to said third input of said second Nand gate means and to said third input of said fourth Nand gate means;

and wherein said electrical lead means connecting said transistor output of said eighth means to said Nand gate latches includes an electrical lead to a second input of said second Nand gate and an electrical lead to a second input of said fourth Nand gate;

and wherein said second means comprises further:

electrical lead means connected between said output of said first Nand gate means and said bit input of said shift register.

4,012,603

ECHO SUPPRESSOR HAVING SELF-ADAPTIVE MEANS

Takashi Araseki, and Kazuo Ochiai, Tokyo, both of Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1975, Ser. No. 606,791

Claims priority, application Japan, Aug. 27, 1974, 49-97533; Mar. 27, 1975, 50-37277

Int. Cl.² H04B 3/20

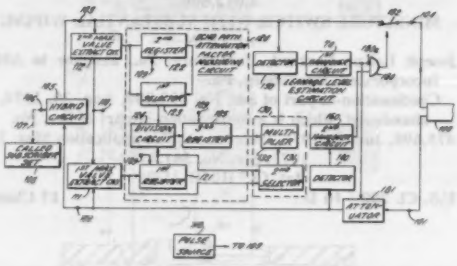
U.S. Cl. 179—170.6 **15 Claims**

11. An echo suppressor for use in a communications network coupling a calling subscriber to a called subscriber comprising a four-wire circuit having an input path for incoming signals from the calling subscriber and an output path for outgoing signals from the called to the calling subscriber, a two-wire circuit coupled to the called subscriber; hybrid means coupled between said two-wire circuit and said four-wire circuit to provide impedance balance between said circuits; the improvement comprising;

first means coupled to said input and output paths for generating a first signal representing the ratio of the signal values in said paths, said values being obtained over

periods of time which are mutually different but are at least partially overlapping;

second means coupled to said input path and said first means for generating a product signal representing the product of the first signal and the signal in the incoming path and obtained at a point in time after the first signal is generated;



third means coupled to said second means and said output path for generating a control output when the signal in the output path is greater than said product signal;

fourth means for disconnecting said output path when said control output is absent.

4,012,604

MICROPHONE FOR THE TRANSMISSION OF BODY SOUNDS

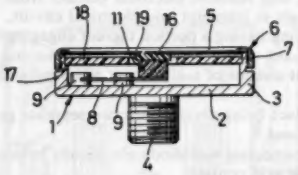
Blasius Speidel, Hochmeisterstrasse 244, 7455 Jungingen, Germany

Filed June 17, 1975, Ser. No. 587,684

Claims priority, application Germany, June 18, 1974, 2429045

Int. Cl.² H04R *1/46, 7/22*

U.S. Cl. 179—121 C **33 Claims**



1. A microphone for the reception and conversion of low frequency sound, especially body sound signals, which can be used advantageously in conjunction with blood pressure measuring devices and the like, the microphone comprising in combination:

a cup-shaped microphone housing having a bottom and a generally tubular side wall with a rim defining an open upper end of the housing;

a circular membrane covering the open end of the housing and having a narrow peripheral edge portion clamped against the rim of the side wall;

a substantially flat flexural piezoelectric transducing wafer arranged inside the housing;

means for mounting the transducing wafer above the housing bottom, a distance from the membrane, and in substantially parallel alignment with the latter, the mounting means holding the transducing wafer in a cantilever fashion so as to allowing a portion thereof to flex freely in displacement alignment with the center of the membrane; and

a resiliently compressible transmitter body interposed between and engaging both the membrane and said flexing portion of the wafer, at least a portion of the transmitter body, including the extremity with which it is engaged against the wafer, being of a cellular, foamed material suited for the transmission of low frequency sound vibrations.

4,012,605

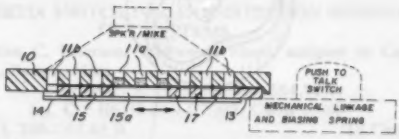
INPUT/OUTPUT TRANSDUCER WITH DAMPING ARRANGEMENT

Leon Jasinski, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 21, 1976, Ser. No. 678,794

Int. Cl.² H04R *1/28*

U.S. Cl. 179—180 **16 Claims**



1. An improved transducer arrangement operable in both input and output modes and adapted for use in apparatus having an enclosure with a plurality of apertures therein to permit the passage of sound waves therethrough, including in combination;

grille means having a plurality of openings and mounted on the enclosure adjacent the enclosure apertures and positioned in a first operational mode wherein said grille openings are aligned with respective ones of the enclosure apertures to permit the passage of sound waves therethrough when the transducer is in the output mode;

control means for positioning said grille in a second operational mode so as to overlie a given number of the enclosure apertures when the transducer is in the input mode;

damping means for restricting by a predetermined amount the passage of sound waves through the enclosure apertures not overlaid by said grille when in said second operational mode; and

means for returning said grille to said first operational mode upon deactivation of said control means.

4,012,606

PLURAL SWITCH SLIDING CAMS ACTUATED BY PREDETERMINED PROGRAM GROOVES ASSOCIATED WITH COMMON DRIVING MECHANISM

Philip Hutt, Milford, Conn., assignor to General Electric Company, Fort Wayne, Ind.

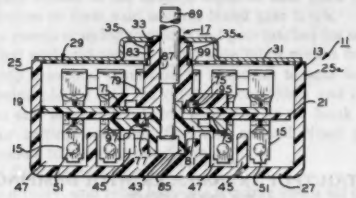
Filed Apr. 7, 1975, Ser. No. 565,648

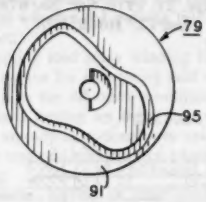
Int. Cl.² H01H *3/42, 21/84*

U.S. Cl. 200—18 **37 Claims**

1. An electrical switch comprising a casing having a plurality of means selectively operable for respectively completing a circuit through said casing, a pair of means disposed generally in overlaying relation in said casing and movable with respect to each other in a predetermined program for controlling the operation of said circuit completing means, and means rotat-

ably mounted in said casing for driving each of said controlling means in the predetermined program with respect to each





other so as to effect the selective operation of said circuit completing means.

4,012,607

MINIATURE TIMER

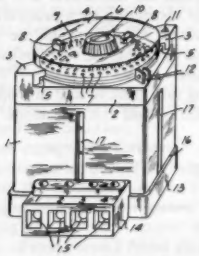
Dieter Graesslin, and Peter Schonhardt, both of Georgen, Black Forest, Germany, assignors to Dieter Graesslin Feinwerktechnik, Germany

Filed Dec. 16, 1974, Ser. No. 533,228

Claims priority, application Germany, Dec. 17, 1973, 2362563

Int. Cl.² H01H *9/00, 43/00*

U.S. Cl. 200—38 D **7 Claims**



1. A miniature timing switch comprising an electrically-driven motor, a switchable electric contact for selectively connecting two conductor elements, a gear drive system connecting an output of said motor to drive a programmable actuator mechanism for selectively opening and closing said electric contact, and an insulating housing mounting and containing said motor, contact, conductor elements, gear system, and actuator mechanism, and segregating electrical components from mechanical components of the switch, wherein the housing comprises:

a base plate;

an annular, upstanding wall attached to said base plate about a periphery thereof;

a dividing wall extending parallel to said base plate interiorly of said upstanding wall and spaced from said base plate to form a first, electrical chamber; and

a front plate attached to an end of said upstanding wall opposite said base plate and spaced from said dividing wall to form a second, mechanical chamber separated from said electrical chamber,

said front plate carrying a portion of said programmable actuator mechanism adjacent an outer surface thereof.

4,012,608

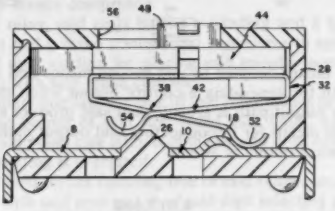
MINIATURE SWITCH WITH SUBSTANTIAL WIPING ACTION

Joseph LaRue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 498,887, Aug. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 475,698, June 3, 1974, abandoned. This application Mar. 25, 1975, Ser. No. 561,815

Int. Cl.² H01H *15/08*

U.S. Cl. 200—16 D **17 Claims**



1. A switch, comprising:

a housing of dielectric material,

a pair of spaced terminals fixed on the housing,

a slide element mounted in said housing and carrying a resiliently deflectable electrical contact,

said slide element in a first position bridging said electrical contact across said terminals completing an electrical circuit therebetween,

said slide element being movable to a second position disengaging said resilient electrical contact from one of said terminals to interrupt said electrical circuit,

said housing having a portion thereof engaging said contact when said sliding element is in said second position to prevent chatter of said contact when subjected to vibration,

said contact being divided into two separate portions,

a diode, and

means connecting said diode electrically between said portions of said contact.

4,012,609

CIRCUIT-INTERRUPTERS USING SPACED-APART BARS FOR CONDUCTOR-ASSEMBLIES

Charles M. Cleaveland, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

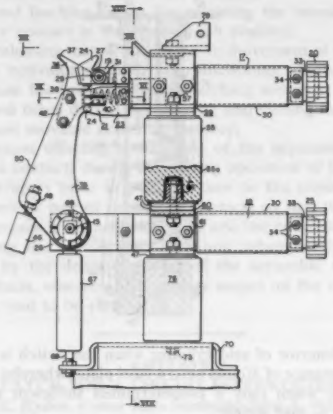
Continuation of Ser. No. 308,370, Nov. 21, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,499

Int. Cl.² H01H *9/00;* **H02B** *1/00;* **H01B** *17/06*

U.S. Cl. 200—50 AA **18 Claims**

1. The combination in a circuit-breaker structure of a first stationary power-conductor assembly, stationary contact means fixedly secured adjacent one end of said first stationary power-conductor assembly, means defining a second stationary power-conductor assembly, insulating post means spacing said first and second stationary power-conductor assemblies apart and in generally parallel arrangement, movable bridging contact means pivotally supported adjacent one end of said second stationary power-conductor assembly, each of said first and second stationary power-conductor assemblies comprising two or more laterally spaced stationary rectangular power bus-bar elements commonly stationarily mounted relevant to one another, at least two of the two or more laterally-

spaced stationary rectangular power bus-bar elements of each power-conductor assembly extending substantially the entire axial length of its respective stationary power-conductor as-



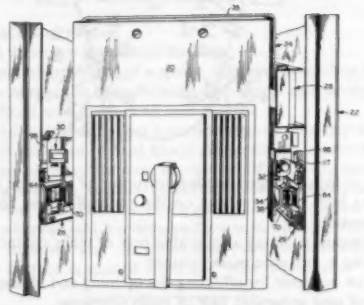
sembly, and means for pivotally rotating said movable bridging contact means into contacting engagement with said stationary contact means for effecting closure of the electrical circuit through the circuit-interrupter.

4,012,610

DRAWOUT APPARATUS HAVING IMPROVED TRIP INTERLOCK

Eric Axel Ericson, Plainville, and Frederick Daniel Kaufhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,616
Int. Cl.² H01H *9/20;* **H02B** *11/00*
U.S. Cl. 200—50 AA **9 Claims**



1. Drawout apparatus for racking a circuit breaker into and out of a compartment in an electrical enclosure, wherein the circuit breaker and the enclosure are equipped with mating primary and secondary disconnect contacts, said drawout apparatus comprising, in combination:

A. a carriage mounting the circuit breaker;

B. opposed rail assemblies mounted by said enclosure and supporting said carriage for movement between an extended position where the primary and secondary contacts are disengaged and an engaged position where the primary and secondary contacts are engaged;

C. means defining a test position intermediate said extended and engaged positions where the primary contacts are disengaged and the secondary contacts are engaged, said carriage being manually movable on said rail assemblies between said extended and test positions;

D. a racking mechanism engaging said carriage to forcibly move said carriage between said test and engaged positions; and

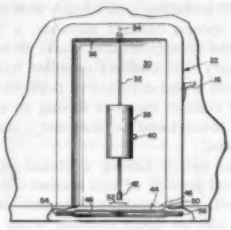
E. a trip interlock including an actuator operatively coupled with a latch member of the circuit breaker and movable between a first, circuit breaker tripping-closure disabling position and a second, circuit breaker closure enabling position under the control of said racking mechanism, said racking mechanism positioning said actuator in said second position to enable closure of the circuit breaker incident with its movement of said carriage into said test and engaged positions, said racking mechanism positioning said actuator in said first position to initiate tripping of the circuit breaker incident with its initial movement of said carriage away from said test and engaged positions, and said racking mechanism maintaining said actuator in said first position to disable closure of the circuit breaker while said carriage is between said test and engaged position.

4,012,611

INERTIA SWITCH FOR ANTI-INTRUSION SENSING SYSTEMS

Christian C. Petersen, Westwood, Mass., assignor to Cega, Inc., Boston, Mass.

Filed Mar. 3, 1975, Ser. No. 554,717
Int. Cl.² H01H *35/14, 3/02;* **G08B** *13/00*
U.S. Cl. 200—61.45 R **10 Claims**



1. An inertially responsive sensor for sensing an impact or motion generating phenomena imparted to a housing comprising:

a body of predetermined mass;

supporting means for flexibly supporting said body a selected distance from a given position upon said housing and configured to permit said body to move to attain a state of rest; and

switch means having at least two components including a magnetically actuable switching device and a magnet one of said components being fixedly mounted upon said housing, the other of said components being mounted upon said supporting means and movable therewith, said switching device being configured comprising at least two ferromagnetic material switch contact members which extend, from mutually spaced supportive locations to overlap within a region for mutual contact thereof, said region thereby exhibiting an enhanced quantity of said ferromagnetic material with respect to regions of said switching device immediately adjacent thereto, said magnet being mounted for asserting a magnetic influence of only one polar sense and with said switch device switch contact overlap region, said component mounting being arranged such that the magnetic attraction between said switch contact overlap region and said magnet effects a bias for said supporting means to move to attain a stable state of positional adjacency between said magnet and said region, said body attaining said state of rest in correspondence with said attainment of said stable state, induced relative movement between said components wherein said magnetic influence is asserted outwardly of

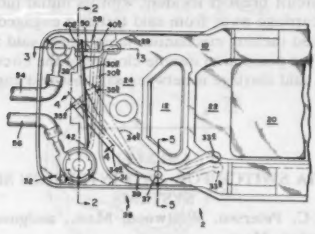
said region effecting a magnetic actuation of said switching device to provide a sensing output.

4,012,612

SEAT BELT BUCKLE SWITCH ASSEMBLY HAVING SELF CLEANING CONTACTS

Yogendra Singh Loomba, Washington, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 6, 1975, Ser. No. 629,352
Int. Cl.² H01H *3/16, 1/60;* A44B *19/00*
U.S. Cl. 200—61.58 B **18 Claims**



1. A buckle comprising:

a housing defining a switch cavity and a tongue cavity;

an electric switch disposed in said switch cavity, said electric switch including a stationary first contact member, a movable second contact member, a biasing means for said second contact member, and an actuation member;

said stationary first contact member having a conductive portion and a non-conductive portion;

said second contact member having an elongated shape, a movable contact end portion and a stationary mounting end portion;

said electric switch having a closed position when said contact end portion of said second contact member is in contact with said conductive portion of said first contact member and an open position when said contact end portion of said second contact member is in contact with said non-conductive portion of said first contact member, said biasing means biasing said second contact member to said closed position of said electric switch;

said actuation member having a tongue end, a switch end, and a pivot point between said tongue end and said switch end, said tongue end extending adjacent to said tongue cavity, said switch end engaging said second contact member, said actuation member pivotable on said pivot point to move said contact end portion of said second contact member from said closed position to said open position of said electric switch.

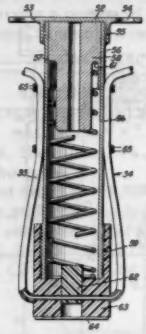
4,012,613

INERTIAL SWITCH

Jack H. Watson, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 78,189, Dec. 23, 1960. This application Oct. 18, 1963, Ser. No. 342,320
Int. Cl.² H01H *35/14*
U.S. Cl. 200—61.08 **2 Claims**

1. An inertial switch comprising a cylinder, a cap secured to one end of said cylinder, said cap having a central bore therethrough running parallel to said cylinder and a transverse hole communicating with said bore a wire inserted in the hole in said cap; a shearing member mounted in the bore, having a hole in which said wire is inserted and having a portion extending into the interior of said cylinder; a coil spring located within said cylinder having one end contacting said cap; a base secured to the other end of said cylinder; and a piston contacting said spring and base and having an elongated central portion; said spring being relatively long compared to the length required to stop the elongated portion of said piston from striking the portion of said shearing member extending



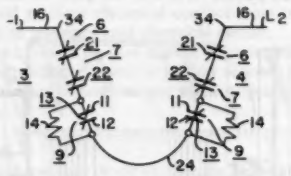
into the interior of said cylinder when the switch is dropped from a distance of 40 feet onto a steel plate, whereby said wire is broken when only a predetermined sufficient energy is imparted to said spring.

4,012,614

HIGH-VOLTAGE CIRCUIT-INTERRUPTER HAVING A CLOSING RESISTANCE AND IMPROVED SHUNTING-RESISTANCE CONTACTS THEREFOR

Hayes O. Dakin, Jr.; Lawrence A. Brunson, both of Irwin, Pa.; Frank L. Reese, deceased, late of Monroeville, Pa., and by Blanche C. Reese, executrix, Lansford, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1973, Ser. No. 425,670
Int. Cl.² A01H *33/16*
U.S. Cl. 200—144 AP **12 Claims**



1. A high-voltage circuit-interrupter of the type for eliminating high-voltage surges on the controlled line comprising, in combination:

a. means defining a separable pair of main contacts including a movable main contact;

b. an operator for effecting the opening and closing motions of said separable pair of main contacts;

c. means defining a separable pair of resistance contacts including a movable resistance contact disposed in electrical series relationship with said separable pair of main contacts so that in the closed-circuit position of the circuit interrupter the line current passes serially through the two pairs of separable contacts;

d. means defining a closing resistance connected electrically in shunt with said separable pair of resistance contacts so that when said separable pair of resistance contacts are closed the closing resistance is shorted out of the controlled circuit;

a first biasing means for biasing said movable resistance contact to the closed-circuit position;

a second biasing means for biasing said movable resistance contact to the open-circuit position;

said operator including a movable activator member movable in the opening and closing directions and corre-

spondingly charging said first and second biasing means during such opening and closing movements;

a first latching means for retaining the movable resistance contact in the closed-circuit position;

a second latching means for retaining the movable resistance contact in the open-circuit position;

latch-releasing means responsive to movement of said movable activator member and functioning alternatively to release the first and second latching means at predetermined times during the opening and closing movements of said movable activator member;

and means effecting the closing of the separable pair of main contacts during the closing operation of the circuit interrupter prior in point of time to the closing of the separable pair of resistance contacts so that the closing resistance is connected serially into the controlled circuit during the closing operation and subsequently shorted out by the delayed closing of the separable resistance contacts, whereby high-voltage surges on the controlled line tend to be eliminated.

4,012,615

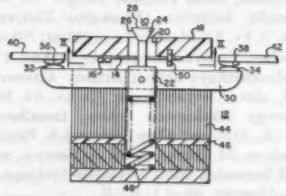
LATCH FOR A CIRCUIT INTERRUPTER

Howard R. Ryden, Forest Hills Borough; John A. Wafer, Monroeville, and Paul G. Slade, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1975, Ser. No. 598,618

Int. Cl.² H01H *3/12*

U.S. Cl. 200—325 **7 Claims**



1. A latch comprising:

a block having a bore therethrough;

a wire member formed of a spring material, extending transverse across the bore through said block and having one end fixed with respect to said block;

a movable member having a portion disposed for movement within the bore of said block comprising a tapered portion constructed for easy movement of said wire member and a latching surface constructed to be restrained by said wire member and being movable to a latched position wherein said latching surface is in contact with said wire member and an unlatched position wherein said latch surface is spaced from said wire member.

4,012,616

METHOD FOR METAL BONDING

John W. Zelahy, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jan. 2, 1975, Ser. No. 538,158

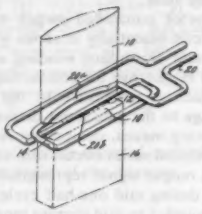
Int. Cl.² B23K *13/00*

U.S. Cl. 219—9.5 **5 Claims**

1. An improved method for metallurgically bonding a plurality of metal components at cooperating interface portions of the components, comprising the steps of:

positioning the cooperating interface portions in spaced apart opposed relationship;

applying high frequency induction heating to the interface portions from within the space between them, the heating being controlled as a function of the heating rates of the metal of the components and the cross-sectional shapes of the cooperating interface portions of the components to produce substantially uniform heating concurrently across the opposed interface portions to heat the portions to a temperature less than that which will detrimentally affect the metal of the components but at which metal upset can occur; and then



impacting the opposed portions together at a high energy rate with a force sufficient to upset each opposed portion and to expel metal from each component from between the impacting portions to produce a forged joint.

4,012,617

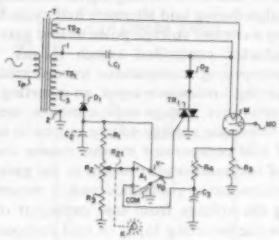
POWER CONTROLLER FOR MICROWAVE MAGNETRON

Robert Virgil Burke, and Thomas Eugene Hester, both of Fort Wayne, Ind., assignors to Litton Systems, Inc., Huntington, Ind.

Filed July 24, 1975, Ser. No. 598,864

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B **15 Claims**



1. The combination in a microwave oven power supply comprising:

transformer means, said transformer means having a primary winding for connection to a source of AC and a secondary winding for providing a high voltage AC transformed from said primary across the secondary winding ends, said AC voltage having a generally cyclically varying sinusoidal waveform including a first one-half cycle in which the voltage level over a period of time, T, rises from zero to a maximum in one polarity direction and then reduces to zero followed by an alternate half cycle in which the voltage level over a time, T, rises from zero to a maximum in an opposite polarity direction and then reduces to zero;

capacitor means;

a magnetron, said magnetron having uni-directional current-carrying characteristics so as to conduct current only on one-half cycle of AC;

means connecting said secondary winding, said capacitor means and said magnetron in an electrical series circuit;

semiconductor controlled switch means of the type having a gate input and a pair of current-conducting main terminals, said switch means further being of the type having an electrically nonconductive state and responsive to application of a control voltage to its said gate input for substantially instantaneously, in a time substantially less

than T, switching into a current-conducting condition to pass current between said main terminals and responsive to the current between said main terminals reducing effectively to a level of zero and absent a control voltage at said gate input for substantially instantaneously, in a time substantially less than T, restoring to the electrically nonconductive state;

said semiconductor controlled switch means being connected in circuit essentially in series with said capacitor means and said secondary winding and essentially in shunt of said magnetron for conducting current in shunt of said magnetron responsive to the application of a control voltage to the gate input thereof;

current monitoring means, comprising resistor means connected in electrical series circuit with said magnetron, for providing an output signal representative of the magnetron current during said one-half cycle;

timing means coupled to said current monitoring means for providing a time varying signal that changes in level with lapse of time during the alternate half-cycle of AC and has an initial level representative of the current level in said magnetron during the preceding one-half cycle, whereby said time varying signal attains a predetermined level as a function of both the magnetron current level and lapse of time,

said timing means comprising: a resistor and a capacitor electrically connected in series circuit across said resistor of said current monitoring means, said circuit having a time constant, T_c, where T_c equals the product of the capacitance measured in farads and R is the value of resistance measured in ohms, with said T_c being less than ½ F, where F is the frequency of the AC supplied by said transformer;

control means coupled to said timing means responsive to the level of said time varying signal attaining a predetermined value during said alternate half cycle for thereupon providing a control voltage pulse to said gate input of said semiconductor controlled switch means, said control means comprising: comparator means, said comparator means having a reference input, an inverting input and an output; reference voltage source means; means connecting said reference voltage source means to said reference input of said comparator means; means connecting the output of said comparator means to the gate electrode of said semiconductor controlled switch means; and means coupling the voltage from said capacitor of said timing means to the inverting input of said comparator means.

4,012,618

METHOD AND APPARATUS FOR THE SUCCESSIVE WELDING OF CONSECUTIVE CHAIN LINKS

Bruno Ebel; Günter Krumholz, and Paul Rahn, all of Cologne, Germany, assignors to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Germany

Filed Feb. 25, 1975, Ser. No. 553,039

Claims priority, application Germany, Feb. 25, 1974, 2408971; Dec. 23, 1974, 2461252

Int. Cl.² B21L *3/00*

U.S. Cl. 219—52 **4 Claims**

1. A method for the successive welding of the joints of consecutive links forming a link chain, comprising the following steps:

a. advancing the chain for bringing a link to be welded directly below a welding position;

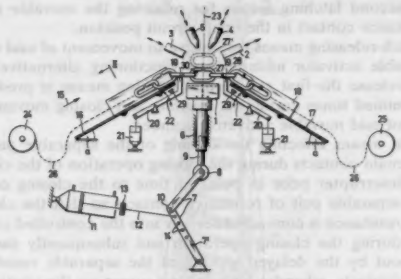
b. applying a tensioning force to said chain parallel to the direction of chain advance;

c. during step (b), guiding the two links flanking the link to be welded into a common plane of alignment for effecting a setting of said link to be welded, by the tensioning force, into a plane disposed at 90° to said plane of alignment;

d. raising said link to be welded into a welding position in a plane disposed at 90° to said plane of alignment;

e. firmly maintaining in the welding position the link to be welded;

f. welding the link in the welding position; and



g. subsequent to step (f), lowering the just-welded link from the welding position.

4,012,619

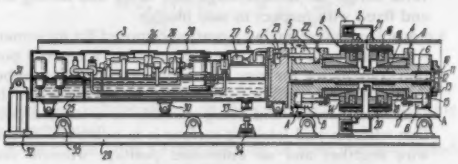
MACHINE FOR THE RESISTANCE BUTT WELDING OF PIPES BY FUSION

Viktor Senderovich Lifshits, Kavkazsky bulvar, 21, korpus 2, kv. 41, Moscow; Vladimir Nikitich Baranov, Elektrostal, prospekt Lenina, 30/13, kv. 16, Moskovsakaya oblast; Lionid Pavlovich Shklyanov, Elektrostal, ulitsa Zhulyabina, 8, kv. 14, Moskovskaya oblast; Olimpiada Mikhailovna Brjukvina, Elektrostal, ulitsa Elagina, 14, kv. 85, Moskovskaya oblast; Tamila Iosifovna Osinskaya, Elektrostal, ulitsa Zhulyabina, 3, kv. 91, Moskovskaya oblast; Nikolai Makarovich Dergachev, Elektrostal, prospekt Juzhny, 17, korpus 1, kv. 178, Moskovskaya oblast; Arkady Alexeevich Pevnev, Elektrostal, ulitsa Oktyabrskaya, 13, kv. 44, Moskovskaya oblast; Georgy Nikolaevich Petrov, Izmailovsky bulvar, 34/32, kv. 8, Moscow; Oleg Sergeevich Papkov, Samarkandsky bulvar, 24, korpus 3, kv. 3, Moscow, and Vladimir Ivanovich Khomenko, ulitsa Miklukho-Maklaya, 33, korpus 2, kv. 372, Moscow, all of U.S.S.R.

Filed June 6, 1975, Ser. No. 584,494

Int. Cl.² B23K *11/04*

U.S. Cl. 219—101 **2 Claims**



1. A machine for flash-butt welding of pipes, comprising: a welding transformer (1) with current leads (2), embracing the pipes to be welded (3,4) from the outside, said transformer being connected with the pipes by said leads in the course of the welding; a manipulator (5) for aligning and moving the pipes, disposed inside the pipes, and including a body (7) of said manipulator; a first aligning unit (8) mounted movably with respect to said body; a second aligning unit (9) mounted immovably with respect to said body and insulated electrically from the latter; clamps (16) for the pipes, disposed in radial slots of said aligning units; hydraulic cylinders (15) for actuating said clamps, arranged on bodies of said aligning units; means for moving the pipes in the course of the welding; hydraulic cylinders (22) for said moving means, whose bodies are immovably attached to said body of the movable aligning unit between said hydraulic cylinders of the clamps of one of the types to be welded; piston rods (23) of said hydraulic cylinders of the moving means, immovably attached to said body of the manipulator; a hydraulic system (27) for feeding

and controlling said hydraulic cylinders of the clamps and of the moving means; a rod (6) for moving said manipulator with respect to the pipes during auxilliary operations, said rod being immovably connected with said body of the manipulator; and a partition (24) dividing the bore of said rod longitudinally into two spaces, one space (25) for receiving a working fluid, the other space (26) accommodating the hydraulic system on said partition, for feeding and controlling actuators of said clamps as well as said moving means.

4,012,620

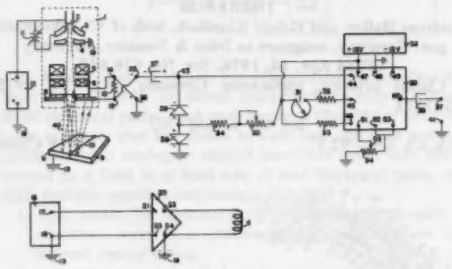
ELECTRON BEAM SEAM FINDING DEVICE

Peter Daniel Sciaky, Oak Lawn, Ill., assignor to Sciaky Bros., Inc., Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,091

Int. Cl.² B23K *9/00*

U.S. Cl. 219—121 EM **6 Claims**



1. A method of determining the position of an electron beam with respect to the seam between two adjoining work pieces comprising the steps of directing the said beam towards the seam between the adjoining work pieces; oscillating the beam across the seam and work pieces to cause variations in the emanation of secondary electrons from the said work pieces; collecting secondary electrons thus produced; passing the said secondary electrons through a resistor so as to generate a varying voltage proportional to the instantaneous value of the secondary electrons collected; applying the said varying voltage to a wave form converter, converting the instantaneous values of said varying voltage, in said converter, to a fractional power of said instantaneous values of said voltage applying the output signal of the converter to one set of deflection plates of a cathode ray oscilloscope provided with two pairs of deflection plates at right angles to one another whose second set of deflection plates is synchronized with the periodic signal causing the oscillation of the beam across the seam and comparing the position of the peak of the said converted voltage with a preset reference.

4,012,621

CONSUMABLE ELECTRODE FOR INITIATING SCARFING

Youtaro Uchida; Yoshihiko Asai, and Goro Miya, all of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

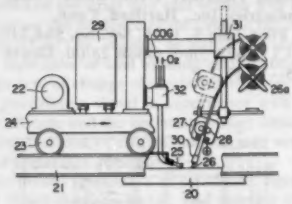
Division of Ser. No. 494,362, Aug. 2, 1974, Pat. No. 3,915,762. This application June 24, 1975, Ser. No. 589,832

Claims priority, application Japan, Aug. 6, 1973, 48-88177; Aug. 6, 1973, 48-88176

Int. Cl.² B23K *35/368*

U.S. Cl. 219—146 **4 Claims**

1. A consumable electrode used for a scarfing initiation method, which consists essentially of a steel sheath filled up with a powdery mixture weighing more than 5% of the total weight of said electrode, said powdery mixture consisting of a metallic oxygen source material in amounts of 5 to 50% by



weight and of a combustible material consisting mainly of iron powder as the remainder of the mixture.

4,012,622

METHOD AND APPARATUS FOR COUNTING SMALL PARTS

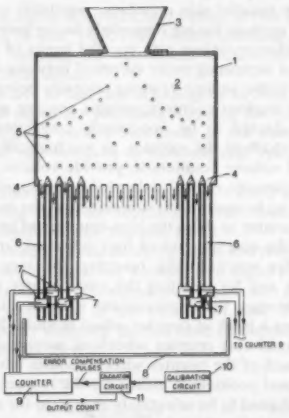
John T. Boys, Christchurch, New Zealand, assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Continuation-in-part of Ser. No. 352,764, April 19, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,601

Claims priority, application United Kingdom, Apr. 20, 1972, 18353/72

Int. Cl.² G06M *11/00*

U.S. Cl. 235—92 PK **21 Claims**

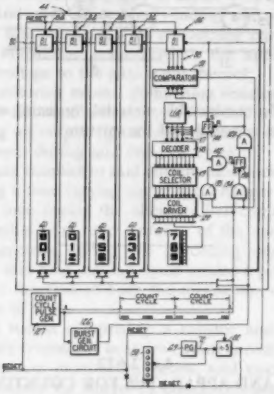


1. A method of counting small parts comprising feeding the parts in bulk to discharge a stream of parts into a separating region leading to a plurality of outlet channels, the separating region including distributing means for distributing the parts in a random manner over the outlet channels, whereby parts will pass through each outlet channel, counting the total uncorrected number of parts passing through each outlet channel, correcting for errors in the total uncorrected number of counting the number of parts passing through each outlet channel, wherein the correction is proportional to the square of the total uncorrected number of pieces counted and adding together the correction and the total uncorrected number of parts.

4,012,623
COUNTING AND INDICATING SYSTEM

Donald Whiting Fleischer, Wethersfield, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed June 5, 1975, Ser. No. 584,216
Int. Cl.[2] B67D 5/06; G08B 28/00; G06M 1/10
U.S. Cl. 235—92 FL 31 Claims

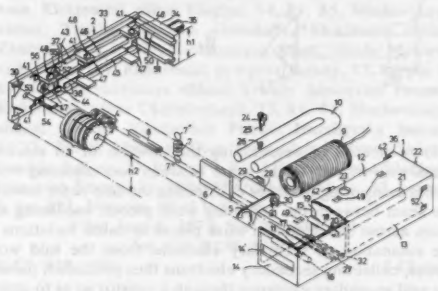


1. In a resettable register for a fuel pump computer having a variator with a rotary volume shaft adapted to be driven by a fuel meter in accordance with the volume amount of fuel delivered, the variator being settable for establishing the unit volume price of the fuel and having a rotary cost output driven by the variator volume shaft in accordance with the unit volume price established by the variator setting; the resettable register comprising a register frame with a pair of spaced generally parallel side members, resettable volume and cost counter sections having oppositely facing pairs of volume and cost readout counters with parallel banks of coaxial counter wheels of increasing order mounted between the register side members, the volume readout counters being resettable mechanical readout counters, volume counter mechanical drive means adapted to be operatively connected to the rotary volume shaft of the variator to mechanically drive the mechanical volume counters to provide volume readouts of the volume amount of fuel delivered, cost counter drive means adapted to be operatively connected to the rotary cost output of the variator to drive the cost counters to provide cost readouts of the cost amount of fuel delivered, and register reset means for mechanically resetting the mechanical volume counters and for resetting the cost counter section between fuel deliveries; the improvement wherein each cost counter comprises a bank of counter wheel modules having a bank of said coaxial cost counter wheels of increasing order respectively, each of the counter wheel modules having electromagnetic wheel positioning means for the respective cost counter wheel adapted to be selectively energized for selectively angularly positioning the wheel, the electromagnetic wheel positioning means of each bank of counter wheel modules being selectively energizable for selectively angularly positioning the bank of cost counter wheels for providing a selected cost readout; wherein the cost counter drive means comprises pulse generator means and pulse generator operating means adapted to be operatively connected to the rotary cost output of the variator to operate the pulse generator means to generate an electrical pulse train with a pulse for each predetermined incremental cost amount of fuel delivered; wherein the resettable cost counter section comprises resettable primary electronic counter means connected to the pulse generator to be operated by the electrical pulse train to accumulate a cost count of the cost amount of fuel delivered, and electrical drive means operated by the primary electronic counter means for selectively energizing the electromagnetic wheel positioning means for each cost counter wheel to position the coaxial cost counter wheels of each bank for providing a cost readout of the cost count accumulated in the primary electronic counter means; and wherein the register reset means is operable between fuel deliveries for resetting the cost counters by resetting the electronic counter means of the cost counter section.

4,012,624
ELECTRIC PULSE COUNTER AND PLASTIC HOUSING THEREFOR

Andreas Haller, and Heiner Kundisch, both of VS-Schwenningen, Germany, assignors to Irion & Vosseler, Germany

Filed Apr. 14, 1976, Ser. No. 676,647
Claims priority, application Germany, May 14, 1975, 2521372
Int. Cl.[2] G06M 1/02
U.S. Cl. 235—92 C 6 Claims



1. An electromagnetic pulse counting mechanism, comprising a rectangular block shaped housing having a first housing part with a top wall, bottom wall, front wall, and a first side wall, and having an intermediate partition wall spaced from said front wall and extending between said top and bottom walls, a second housing part comprising a second side wall and rear wall, said second housing part being interengageable with said first housing part to enclose the rear and side opposite to said first side wall of said first housing part of said housing; a coil receiving tube extending rearwardly from said partition wall toward said rear wall in said housing; an electromagnetic wound coil positioned over said receiving tube in axis alignment therewith; a U-shaped magnetic yoke having one first leg portion in said receiving tube and within said coil, and a second leg portion disposed in said housing alongside said coil; an armature pivotally supported on said bottom adjacent said coil, and said yoke; a cypher roll having a cypher roll shaft; an indexing mechanism for indexing said cypher roll having an indexing shaft, and journal means defined on said first and second side walls on the opposite side of said partition wall from said coil, for supporting said cypher roll shaft and said indexing mechanism shaft adjacent said armature for actuation of said indexing mechanism by said armature when said coil is excited; and a window defined in said front wall for the visual observation of aligned cyphers on said cypher roll therein.

4,012,625

NON-LOGIC PRINTED WIRING BOARD TEST SYSTEM

Russell H. Bowen, Seminole; Allen L. Clark, Odessa; David C. Davis, Clearwater; Walter E. Gilbert, Largo; Wayne L. Glover, Odessa; Richard J. Walsh, Brooksville, and Robert G. Wehling, Tampa, all of Fla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Sept. 5, 1975, Ser. No. 610,581
Int. Cl.² G01R 31/00
U.S. Cl. 235—153 AC 20 Claims

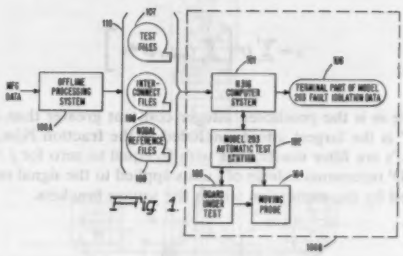


Fig 1

1. A fault analysis system for determining the location of a fault in a printed circuit board, comprised of a map of a plurality of electrical paths, each path having a plurality of electrode node contacts that has failed to pass any one of a series of predetermined analog or digital electrical tests, said failure caused by a fault in at least one of said electrical paths, said fault analysis system comprising:

a. first means for automatically performing a plurality of electrical tests in a predetermined sequence on said printed circuit board;

b. second means, coupled to be responsive to said first means for detecting a failure of any one of said predetermined series of electrical tests on said printed circuit board caused by said fault in at least one of said electrical paths; and,

c. third system means coupled to be responsive to said first and second system means for automatically determining the location of the fault on said failed printed circuit board, said third system means including path generating means coupled to be responsive to said second means and to map information signals indicative of the map of the electrical paths of the printed circuit board under test, said path generating means for automatically generating a plurality of path-signals indicative of at least one path within the failed printed circuit board under test wherein a fault is to be found and further including an automatically movable fault analysis probe, coupled for being responsive to the plurality of path-signals, for automatically and sequentially moving along said at least one path within said failed printed circuit board under test for making electrical contact with predetermined electrical node contacts on said at least one path on said printed circuit board under test.

4,012,626

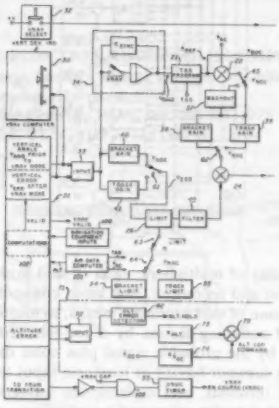
VERTICAL NAVIGATION CONTROL SYSTEM

Ronald J. Miller, Glendale, and Paul A. Rauschelbach, Phoenix, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 18, 1975, Ser. No. 569,340
Int. Cl.² G01C 21/20; B64C 19/00
U.S. Cl. 235—150.26 7 Claims

1. Vertical navigation control apparatus for controlling an aircraft to maintain a predetermined vertical flight path angle from an existing barometric altitude to a desired barometric altitude, said desired barometric altitude being at a predetermined navigation waypoint horizontally offset from a reference VOR/TAC station transmitter, and having receiver apparatus for providing in response to transmissions from sid VOR/TAC station a DME signal indicative of the straight-line distance between the craft and said station and a TO/FROM signal indicating the presence of the craft in the vertical vicinity over said VOR/TAC station, air data apparatus for providing signals indicative of said existing aircraft barometric altitude and the rate of change of aircraft barometric altitude and means for providing a signal in accordance with said desired barometric altitude and the horizontal offset distance between said waypoint and said VOR/TAC station, said vertical navigation control apparatus comprising:

Computer means responsive to said DME signal, said horizontal offset distance signal, said existing aircraft barometric altitude signal and said desired barometric altitude signal for computing a flight path angle error signal indicative of the vertical displacement of the craft from said vertical flight path angle and wherein said flight path



angle error signal is subject to transient errors therein in the vicinity of said VOR/TAC station resulting from any difference between the barometric altitude of the craft and said DME signal,

means responsive to said rate of change of aircraft barometric altitude signal for providing a system damping signal representing the vertical rate error of the aircraft from the vertical rate required to maintain said vertical flight path angle,

means responsive to said flight path angle error signal and said damping signal for supplying a craft control signal from the algebraic sum thereof, and

means independent of said damping signal and responsive to said TO/FROM signal for limiting said flight path angle error signal to a predetermined maximum amplitude when the aircraft is in the vicinity of said VOR/TAC station thereby reducing the response of the craft to said transient errors therein.

4,012,627

DISTRIBUTION-FREE FILTER

Charles E. Antoniak, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 29, 1975, Ser. No. 617,886
Int. Cl.² H03K 5/153; G06F 15/36
U.S. Cl. 235—152 12 Claims

1. A system for detecting signals in a variable environment including noise which comprises:

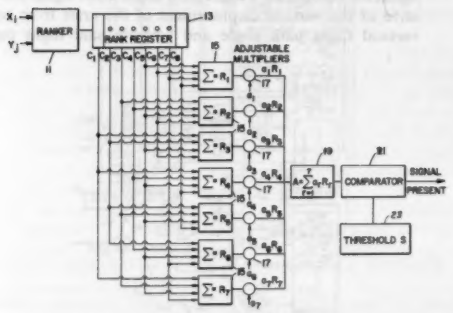
a. first means for receiving data representative of multiple observations of a pre-selected portion of said environment;

b. second means for receiving data representative of presumed noise in said environment;

c. ranking means having an input and an output to arrange said data in order of magnitude, then to produce sequentially at said output a series of signal, each signal having one of two discrete values, said values selected to indicate the source of said ranked datum;

d. a register having an input and an output, said input adapted to receive said series of signals from said ranking means;

e. a plurality of summing means, each of said summing means having a plurality of inputs and an output, the inputs of each of said summing means connected to the output of said register so that a complete orthogonal representation of the two-valued function stored in the register is achieved;



f. a plurality of multipliers, each of said multipliers having an input and an output, said input connected to the output of one of said summing means, to multiply the output of said summing means by a pre-selected factor determined by the probable signal plus noise distribution;

g. a main summer having at least one input terminal and an output terminal, said at least one input terminal being connected to the output of a multiplier;

h. means for comparing the output of said main summer to a predetermined threshold value, whereby the presence or absence of signal in the input data corresponding to said pre-selected portion of the environment may be determined by said comparison.

4,012,628

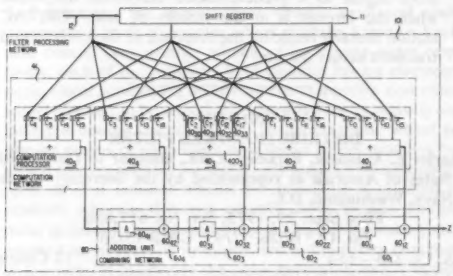
FILTER WITH A REDUCED NUMBER OF SHIFT REGISTER TAPS

Allen Gersho, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 15, 1975, Ser. No. 605,073

Int. Cl.² G06F *7/38;* **H04B** *3/04*

U.S. Cl. 235—156 **17 Claims**



1. A digital filter responsive to a signal x, including a shift register of N stages which provides output signals at each stage of said shift register, which signals are representable by the expressiion $D^i x$ where $D^i x$ is the output signal of the i^{th} stage of said shift register, including a filter processing network which, in turn, includes means for multiplying the output signals of said shift register by preselected filter constants, and including an output terminal responsive to a preselected output signal in said digital filter,

characterized in that:

said filter processing network is responsive solely to said signal x and to the output signal of every m^{th} stage of said shift register to develop a network signal z characterized by the expression

$$z = \sum_{i=0}^{m-1} D^i \left[\sum_{k=0}^{N/m'} C_{mk+i} D^{mk} x \right]$$

where m is the prechosen integer constant greater than one, N/m' is the largest integer included in the fraction N/m, the C_{mk+i}'s are filter coefficients with C_j equal to zero for $j > N$, and D^i represents a delay of i units applied to the signal represented by the expression within the square brackets.

4,012,629

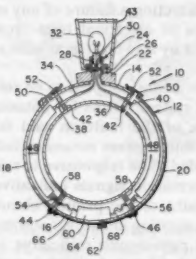
FLASHLIGHT RING

Winston Simms, 128 Belmont Ave., Long Branch, N.J. 07740

Filed Nov. 13, 1975, Ser. No. 631,644

Int. Cl.² F21V *33/00*

U.S. Cl. 240—6.4 W **1 Claim**

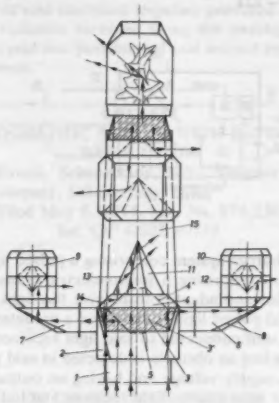


1. A flashlight finger ring device adapted to receive first and second elongated arcuate batteries and a lamp; said device comprising: a generally torodoidal hollow finger encircling member formed of arcuate front, rear, left and right sectors; said left and right sectors being hingedly joined at their rear ends to opposite ends of said rear sector for swinging movement; clasp means carried by the front ends of said left and right sectors for respectively engaging left and right ends of said front sector; said right and left sectors being adapted to respectively receive within their interiors said first and second batteries, first left and right contact means respectively carried by the rear ends of said left and right sectors for respectively electrically engaging rear ends of said first and second batteries; second left and right contact means respectively carried by the left and right ends of said front sector for respectively electrically engaging front ends of said first and second batteries; a lamp socket carried by said front sector for receiving said lamp; first conductor means within said front sector electrically connecting said lamp socket between said second left and right contact means; a switch means carried by said rear sector; and second conductor means electrically connecting said switch means between said first left and right contact means.

4,012,630
LIGHTING FITTING

Richard Gareis, Ziegetsdorferstrasse, D-8400 Regensburg, Germany

Filed Feb. 12, 1975, Ser. No. 549,154
Claims priority, application Germany, June 5, 1974, 2427182
Int. Cl.² A47G 33/16; F21P 1/02
U.S. Cl. 240—10 R 27 Claims



1. A lighting apparatus for use with a light source, comprising in combination:

a first light conducting body operative to conduct the light from said light source by total internal reflection;

at least one distributing element being made from light conducting material and having light reflecting surfaces and being disposed to receive the light conducted by said first body; and

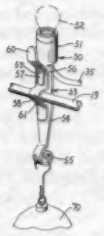
a second light conducting body operative to conduct light by total internal reflections and disposed to receive at least a portion of the light from said distributing element and being operative for radiating the light into the surroundings,

said light reflecting surfaces defining a cavity inside said distributing element and light reflecting surfaces reflecting the light by total internal reflections with substantially none of the light leaving the light conducting material of said distributing element during said reflections.

4,012,631
TREE LIGHTING ASSEMBLY

James J. Creager, 12000 Tollhouse Road, Clovis, Calif. 93612

Filed May 12, 1975, Ser. No. 576,438
Int. Cl.² A47G 33/10, 33/16
U.S. Cl. 240—10 T 1 Claim



1. A Christmas tree lighting assembly comprising:

A. a central flexible insulated cable containing a pair of primary conductors and adapted to be wound about the trunk of a Christmas tree;

B. a multiplicity of lateral cables adapted to be extended along limbs of the tree, having inner ends and outer ends and each having a pair of secondary conductors extending therethrough, the secondary conductors being individually connected to the primary conductors at the inner ends of the lateral cables and the lateral cables with the secondary conductors extending therethrough being branched adjacent to the outer ends thereof;

C. a plurality of lights individually electrically connected in parallel to the secondary conductors of each lateral cable at the outer ends thereof;

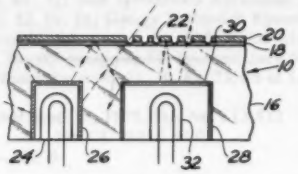
D. clips individually mounted on the lights releasably engageable with limbs of the tree to support the lights thereon; and

E. means borne by each clip for the support of an ornament in depending relation thereon and which is of a substantially spiral configuration for purposes of appearance and the support of an ornament thereon.

4,012,632
DISCRETE FUNCTION ADVISORY ILLUMINATION

Franklin P. Stone, Shelton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 18, 1975, Ser. No. 641,975
Int. Cl.² G01D 11/28; G09F 13/04
U.S. Cl. 240—2.1 12 Claims



1. A display device comprising:

a panel, said panel bearing a plurality of spatially displaced indicia, said panel passing light therethrough in the regions commensurate with said indicia and preventing the passage of light therethrough in other regions;

means for back-lighting said panel indicia with light of a first color; and

means for selectively back-lighting individual of said panel indicia with light of a second color, said second color light being of greater intensity than said first color light.

4,012,633
WIDE DYNAMIC RANGE ANALOG SIGNAL OPTICAL COMMUNICATION SYSTEM

William P. Huntley, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 5, 1975, Ser. No. 610,582
Int. Cl.² H04B 9/00
U.S. Cl. 250—199 6 Claims

1. A communication system for transmitting low level analog electrical signals over a wide dynamic range which comprises:

a wave form generator for producing a preselected carrier frequency to be modulated by the input low level analog signals and thus forming an output of modulated electrical signals;

light emitting diode means for converting the modulated electrical output of said waveform generator into a corresponding optical output, said light emitting diode being

connected so as to use the output of said waveform generator as the input thereof;

transmitting means for transmitting the optical output of said light emitting diode means, said transmitting means being so connected as to use the optical output of said light emitting diode means as an input at a first end thereof and giving an output at a second end thereof;

phototransistor means for converting the transmitted optical output of said light emitting diode into a corresponding modulated electrical output, said phototransistor means being so connected to said transmitting means as to use the output at the second end of the said transmitting means as an input thereof;

amplifying means for amplifying the modulated electrical output of said phototransistor means, said amplifying means being so connected to said phototransistor means as to use the modulated electrical output of said phototransistor means as an input thereof; and

a phase locked loop demodulating means for demodulating the output of said amplifying means to obtain a replica of the low level analog electrical signals to be transmitted, said demodulating means being so connected to said amplifying means as to use the output of said amplifying means as an input thereof.

4,012,634

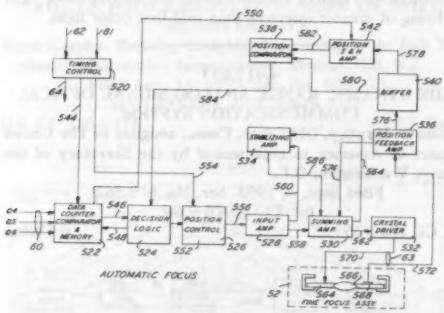
AUTOMATIC FOCUSING SYSTEM INCLUDING QUANTIZING MEANS

John C. Bouton, Doylestown; Melvin E. Partin, Newtown Square, both of Pa., and Robert C. Hilghman, Willingboro, N.J., assignors to Geometric Data Corporation, Wayne, Pa.

Filed Apr. 29, 1974, Ser. No. 465,390

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 **32 Claims**



1. An automatic focusing system for an optical instrument, said system including a light source, said light source comprising a flying spot scanner, said light source directed through said instrument and means responsive to said light source for focusing said optical instrument on a predetermined object, said light source being directed at said predetermined object, said means responsive to said light source including light sensitive means for generating a signal corresponding to the brightness of said light at said light sensitive means, and quantization means responsive to said signal for providing a binary quantization of said signal.

4,012,635

LIGHT BARRIER SYSTEM

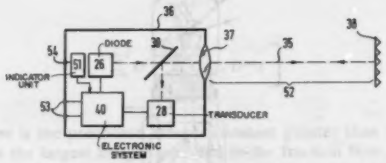
Arthur Walter, Denzlingen, and Jürgen Erdmann, Buchholz both of Germany, assignors to Erwin Sick Optik-Electronik, Waldkirch, Germany

Filed Aug. 13, 1975, Ser. No. 604,215

Claims priority, application Germany, Oct. 24, 1974, 2450648

Int. Cl.² G01D *21/04*

U.S. Cl. 250—221 **17 Claims**



1. A light barrier system comprising a pulsed light source, a light receiver comprising a photo-electric transducer and a pulse amplifier and adapted to receive the light beam transmitted by said pulsed light source over a predetermined path, an indicator unit connected to said light receiver for producing a signal when an obstacle is detected in said path, a rectifier fed by a supply voltage and having an output circuit, for supplying the light source, light receiver and indicator unit, a discharging capacitor in said output circuit of said rectifier and connected to said pulsed light source for periodically operating the same, said capacitor being charged in the intervals between the light pulses of said pulse light source, said capacitor being charged to a substantially lower voltage than said supply voltage and discharged by way of said pulsed light source, a charging resistor connected between said capacitor and said rectifier, a thyristor connected in series with said pulsed light source and in parallel with said capacitor, said thyristor being controlled by the voltage across said capacitor, said light receiver being connected to said rectifier in series with said resistor and with said pulsed light source, and a Zener diode connected in parallel to said pulse amplifier.

4,012,636

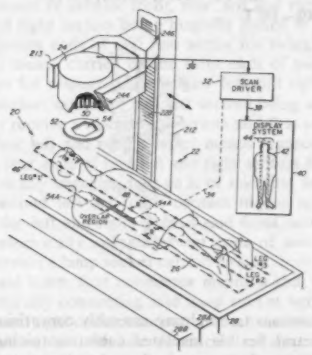
SCANNING GAMMA CAMERA

Lawrence W. Engdahl, Foxboro, Mass.; John F. Batter, Jr., Rochester, N.Y., and Karl J. Stout, Hudson, Mass., assignors to Raytheon Company, Lexington, Mass., a part interest

Filed Sept. 8, 1975, Ser. No. 611,045

Int. Cl.² G01T *1/20*

U.S. Cl. 250—363 S **31 Claims**



1. A radiographic imaging system comprising:

a camera positioned to face a radiating subject, said camera producing electrical impulses in response to quanta of radiation;

means coupled to said camera for inducing a relative motion between said subject and said camera, said relative motion following a prescribed scan format having one portion of said format partially overlapping a second portion of said format; and

means coupled to said camera for gradually tapering the amount of said electrical impulses provided by said camera for radiation received along the overlapping region between said one portion and said second portion of said scan format.

4,012,637

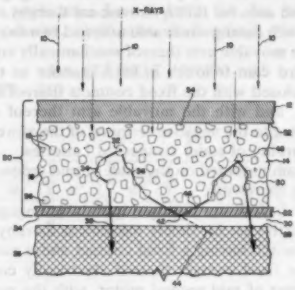
RADIOGRAPHIC SCREEN WITH IMPROVED RESOLUTION

Robert K. Swank, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 5, 1975, Ser. No. 574,238

Int. Cl.² G03B *41/16*

U.S. Cl. 250—475 **4 Claims**



1. In a radiographic intensifying screen and photographic film system of the type comprising a phosphor layer for absorbing x-radiation and re-emitting light, an overlayer on the phosphor layer for forming a smooth surface and a photographic film closely adjacent to the overlayer and having appreciable areas spaced therefrom by an air gap, the improvement comprising:

attenuating means positioned between said phosphor layer and said photographic film for continuously absorbing a portion of said light in substantial proportion to the linear distance said light travels through said attenuating means, so that light which is reflected back into said phosphor layer by the surface between said overlayer and said air gap is more highly attenuated relative to light of the same wavelength passing directly through said air gap to said film, whereby the intensity of such reflected light, which on further deviation reaches the film at laterally removed locations, is greatly reduced by multiple passages through said attenuating means, thereby suppressing adverse effects on the resolution and contrast of the film image.

4,012,638

DENTAL X-RAY ALIGNMENT SYSTEM

Bruce R. Altschuler, 123 Thornell, San Antonio, Tex. 78235; Vincent A. Segreto, 638 Candleglo Drive, San Antonio, Tex. 78239, and Cecil E. Brown, Jr., 13203 Rhame Drive, Oxon-Hill, Md. 20022

Filed Mar. 9, 1976, Ser. No. 665,193

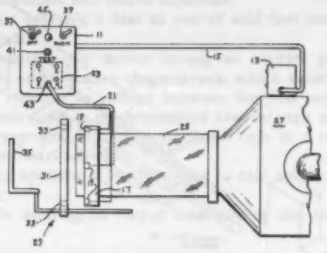
Int. Cl.² G01N *21/00*

U.S. Cl. 250—491 **5 Claims**

1. An apparatus for the alignment of x-ray film with respect to an x-ray beam comprising:

a. a plurality of pairs of radiators and sensors surrounding the path of the x-ray beam;

b. a reflector positioned parallel to the x-ray film and integral therewith; and



c. means for detecting if the plurality of sensors receive equal reflected radiation indicating the alignment of the x-ray film with the x-ray beam.

4,012,639

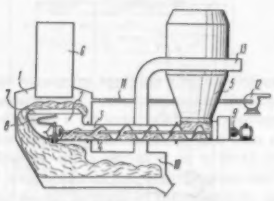
METHOD OF PRODUCING MINERAL BINDER AND APPAPATUS EMBODYING SAME

Robert Matveevich Besprozvanny, prospekt Yuria Gagarina, 28, kor. 3, kv. 72; Iosif Gershevich Abramson, Varshavskaya ulitsa 22, kv. 16; Georgy Borisovich Egorov, Grazhdansky prospekt, 90, kor. 2, kv. 103; Rafail Manusovich Nudelman, Nevsky prospekt, 61, kv., and Jury Vasilievich Nikiforov, Zanevsky prospekt, 30, kv. 23, all of Leningrad, U.S.S.R.

Filed Sept. 15, 1975, Ser. No. 613,512

Int. Cl.² H01J *37/06*

U.S. Cl. 250—492 B **7 Claims**



1. A method of producing a mineral binder comprising, advancing along a path a preground stock of a mineral stock usable for producing a binder therefrom, discharging said mineral stock from said path for movement along a different path, just prior to discharging said mineral stock from the first-mentioned path mixing said mineral stock in a zone in which discharging is taking place, subjecting said mineral stock to irradiation with a beam of accelerated electrons flowing counter to the direction of flow of said mineral stock in said path, and applying said beam of accelerated electrons on said mineral stock in an area in said zone in which said mixing is taking place while said mineral stock is travelling in a direction directly counter to the flow of said accelerated electrons.

4,012,640

X-RAY GENERATOR

William B. McKnight, Huntsville, Ala.; Marian O. Scully, Tucson, Ariz., and William H. Louisell, Palos Verdes, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

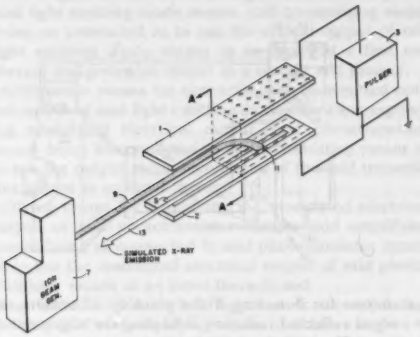
Filed Aug. 30, 1973, Ser. No. 393,239

Int. Cl.² G21G *4/00*

U.S. Cl. 250—493 **2 Claims**

1. A system comprising first means producing a beam of stripped nuclei; a thin hydrogen rich foil strip target means

having a length; and second means connected to the target means and positioned to the beam of stripped nuclei consisting of He^{++} or Li^{+++} so as to cause said beam to intersect the target such that intersection of the beam and the target travels the length of said target at substantially the speed of light.



4,012,641

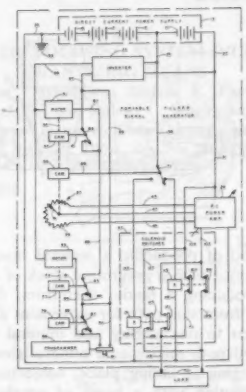
PORTABLE PULSED SIGNAL GENERATOR

Millard S. Brickerd, Jr., and John A. Hudson, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1975, Ser. No. 637,996

Int. Cl.² H03K *3/00*

U.S. Cl. 307—106 **5 Claims**



1. A portable pulsed signal generator, comprising in combination:

a plurality of series connected batteries;

an inverter, having a pair of inputs and a pair of outputs, with one of the inputs thereof connected to the negative terminal of one of the batteries of the aforesaid plurality of series connected batteries, and with other input thereof connected to the positive terminal of said one battery of the aforesaid plurality of series connected batteries;

a first motor, having an input, an output, and a rotatable shaft, with the input thereof connected to one of the outputs of said inverter;

an on-off switch, having a pair of terminals and means for effecting the timely electrical closure thereof, with one of the terminals thereof connected to the electrical output of said first motor, and with the other terminal thereof connected to the other output of said inverter;

a first cam mounted on the shaft of said first motor for rotation therewith

a first cam follower disposed in slidable engagement with said first cam for timely movement thereby;

a first switch having a fixed contact and a movable arm, with the fixed contact thereof electrically connected to said one terminal of the aforesaid on-off switch, and with the movable arm thereof mechanically connected to said first cam follower;

a second cam mounted on the shaft of said first motor for rotation therewith;

a second cam follower disposed in slidable engagement with said second cam for timely movement thereby;

a second switch having a fixed contact and a movable arm, with the fixed contact thereof electrically connected to the movable arm of said first switch and to the other terminal of the aforesaid on-off switch;

a second motor having an input, an output, and a rotatable shaft, with the input thereof connected to said one output of said inverter, and with the output thereof electrically connected to the movable arm of said second switch;

a third cam mounted on the shaft of said second motor for rotation therewith;

a third cam follower disposed in slidable engagement with said third cam for timely movement thereby.

a third switch having a movable arm and two fixed contacts, with the movable arm thereof mechanically connected to said third cam follower in such manner as to be alternately closed with the fixed contacts thereof in response thereto, and with the movable arm thereof electrically connected to the negative terminal of the aforesaid one of said plurality of series connected batteries;

a fourth cam mounted on the shaft of said second motor for rotation therewith;

a fourth cam follower disposed in slidable engagement with said fourth cam for timely movement thereby;

a fourth switch having a fixed contact and a movable arm, with the fixed contact thereof electrically connected to the output of said second motor, with the movable arm thereof electrically connected to said other output of the aforesaid inverter, and with the movable arm thereof mechanically connected to said fourth cam follower in such manner as to be opened and closed with the fixed contact thereof in response to timely movement of said fourth cam follower;

a direct current power amplifier having a predetermined direct current voltage supply, a positive potential input, a negative potential input with respect to said positive potential input, a control input, and a positive potential output, the potential of which is more positive than that of said negative potential input and less positive than that of said positive potential input, with the positive potential input thereof connected to the positive terminal of said one battery of the aforesaid plurality of series connected batteries, and with the negative potential input connected to the negative of another of the batteries of said plurality of series connected batteries;

a potentiometer having a fixed resistance and a movable arm in slidable engagement therewith, with the fixed resistance thereof connected across the aforesaid predetermined direct current voltage supply of said direct current power amplifier, with the movable arm thereof mechanically connected to the shaft of said second motor for rotation therewith, and with the movable arm thereof electrically connected to the aforesaid control input of said direct current power amplifier;

a pair of output terminals;

a first solenoid relay having first and second switches and a solenoid connected thereto for the simultaneous opening and closing thereof, with the first switch thereof connected between the positive potential output of said direct current power amplifier and one of said pair of output terminals, and with the second switch thereof connected between the positive terminal of said one battery

of the aforesaid plurality of series connected batteries and the other of said pair of output terminals, and with the solenoid thereof connected between one of the fixed contacts of the aforesaid third switch and the negative input of said direct current power amplifier;

a second solenoid relay having third and fourth switches and a solenoid connected thereto for the simultaneously opening and closing thereof, with the third switch thereof connected between the positive potential output of said direct current power amplifier and said other of said pair of output terminals, and with the fourth switch connected between the positive terminal of said one of the aforesaid plurality of series connected batteries and said one of said pair of output terminals, and with the solenoid thereof connected between the other of the fixed contacts of said third switch and the negative input of said direct current power amplifier.

4,012,642

JOSEPHSON JUNCTION LOGIC ELEMENT

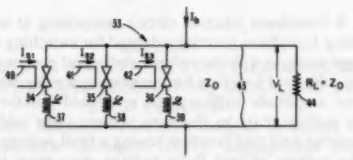
Pierre Léopold Guéret, Thalwil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 412,084, Nov. 2, 1973, Pat. No. 3,891,864. This application June 9, 1975, Ser. No. 585,160

Claims priority, application Switzerland, Nov. 17, 1972, 16755/72

Int. Cl.² H03K *19/195, 3/38*

U.S. Cl. 307—212 **21 Claims**



1. A Josephson junction logic circuit comprising at least a pair of Josephson junction devices connected in parallel forming superconducting loops,

a load shunting said devices,

a source of current connected to said load and said devices, and

means connected to each of said devices for suppressing circulating currents in said loops.

4,012,643

NOISE ELIMINATION CIRCUIT

Hideki Miura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 569,889

Claims priority, application Japan, Apr. 25, 1974, 49-46944

Int. Cl.² H03K *5/08*

U.S. Cl. 307—237 **7 Claims**

1. A noise elimination circuit comprising:

a semiconductor device comprising a first semiconductor region of one conductivity type,

a second semiconductor region of the opposite conductivity type adjacent said first region with a first semiconductor junction therebetween,

a third semiconductor region of the same conductivity type as said first region adjacent said second region with a second semiconductor junction therebetween, first, second and third terminals coupled to said first, second and third regions, respectively,

a fourth terminal connected to said semiconductor device and having at least a portion thereof located adjacent to said first region at a position which is spaced from the said first terminal, and an insulating layer separating said fourth terminal from said first region,

said first semiconductor region having a control region immediately formed in the vicinity of said fourth terminal,

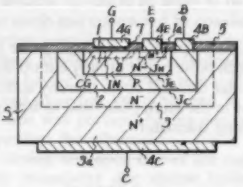
means for applying a signal which has an undesirable noise to said second and fourth terminals,

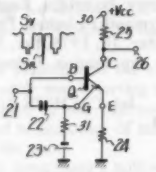
means for applying a bias to one of said first and fourth terminals,

said semiconductor device having an emitter grounded current amplification characteristic which varies due to linear changes in voltage between the first and fourth terminals from a predetermined low through a steeply rising segment to a predetermined high at a relatively constant level segment,

means for applying a power source to said semiconductor device,

means for deriving an output from one of said terminals, and





wherein said means for applying a signal with an undesirable noise characteristic comprises means for applying a video signal including a pedastal and a synchronizing portion, means for adjusting the level of said bias such that the entire desired video signal is at a level on the fourth terminal which causes the emitter grounded current amplification to be located at the relatively constant level segment immediately in the vicinity of the steeply rising segment, whereby noise signals which exceed the level of the desired video signal cause the emitter grounded current amplification to be located in the vicinity of the steeply rising segment and the predetermined low portion such that said noise is substantially eliminated at said output.

4,012,644

BLOCKING OSCILLATOR DRIVER FOR A MICROWAVE LATCHING FERRITE DEVICE

Homer P. Blincoe, Tucker, Ga., assignor to Electromagnetic Sciences, Inc., Atlanta, Ga.

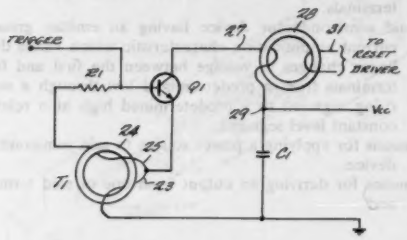
Filed Oct. 16, 1975, Ser. No. 623,007

Int. Cl.² H03K *3/30*

U.S. Cl. 307—275 **7 Claims**

1. In combination, a microwave latching ferrite device having a latch winding having first and second terminals and driving means for said ferrite device, said driving means comprising an emitter coupled blocking oscillator coupled between an input and said latch winding first and second terminals, said emitter coupled blocking oscillator comprising a switching transistor and a transformer having a toroidal core, a primary and a secondary winding, said primary winding coupled between the emitter of said switching transistor and said latch winding second terminal, and said secondary wind-

ing coupled between the emitter and base of said switching transistor, the collector of said switching transistor being coupled to said latch winding first terminal, said emitter coupled blocking oscillator generating a single latch pulse on said



latch winding in response to a trigger pulse on said input with said single latch pulse being rapidly cut off due to saturation of said transformer toroidal core, thereby substantially eliminating variations in the latch pulse due to storage time variations of the switching transistor.

4,012,645

TIMING CIRCUIT

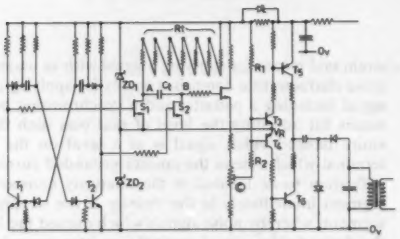
Ernest James Moorey, Ivybridge, England, assignor to M. L. Engineering (Plymouth) Limited, Plymouth, England

Filed Mar. 18, 1975, Ser. No. 559,469

Claims priority, application United Kingdom, Mar. 19, 1974, 12116/74

Int. Cl.² H03K *5/13*

U.S. Cl. 307—293 **5 Claims**



1. A timing circuit comprising:

a threshold device having an input point, and having first and second states, the threshold device being in its first state when the potential at the input point lies above a given voltage threshold and in its second state when the potential at said input point is below said given threshold, the threshold device being normally in its first state,

a current source including a timing resistor connected to a source of charging voltage,

a timing capacitor having a first side connected to said timing resistor and a second side connected to said input point,

first and second switch devices connected to said first and second sides, respectively, of the timing capacitor and to a source of reference potential, said reference potential being above said threshold, and

means for closing said first and second switch devices alternately to connect said first and second sides of the timing capacitor alternately to said source of reference potential thereby causing said timing capacitor to be charged cumulatively during successive closures of said second switch device, the potential at said input point of the threshold device changing progressively with each closure of said first switch device and falling below said given threshold only after a number of alternate closures of said first and second switch devices to cause the transition of the threshold device to a second state, while in the event of failure of the timing capacitor, the potential at said inpt point remains above said given threshold and the threshold device remains in its first state.

4,012,646

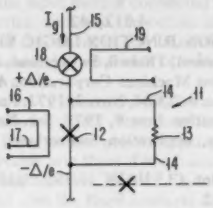
POWERING SCHEME FOR JOSEPHSON LOGIC CIRCUITS WHICH ELIMINATES DISTURB SIGNALS

Frank Fu Fang, Yorktown Heights, and Dennis James Herrell, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,997

Int. Cl.² H03K *3/38, 17/92, 19/195*

U.S. Cl. 307—306 **19 Claims**



1. A Josephson junction circuit comprising at least a single latching Josephson junction adapted for switching from a zero voltage state to a finite voltage state, and means disposed in series with said junction for generating a pulse transient having an amplitude sufficient to reset said junction from the finite voltage state to the zero voltage state said means for generating and said junction having a total voltage drop equal to the voltage of said finite voltage state prior to and after resetting said junction.

4,012,647

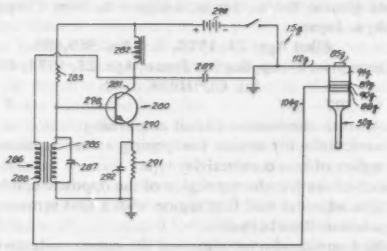
ULTRASONIC MOTORS AND CONVERTERS

Lewis Balamuth, Southampton; Arthur Kuris, Riverdale, and Manuel Karatjas, Glen Oaks, all of N.Y., assignors to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Continuation of Ser. No. 426,822, Jan. 31, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,046

Int. Cl.² H01L *41/08*

U.S. Cl. 310—8.1 **38 Claims**



1. A driving circuit for driving an ultrasonic transducer having a piezoelectric element, said transducer being capable of vibration at a plurality of frequencies including a desired frequency, comprising:

A. a power supply for producing a power signal;

B. a reference voltage;

C. a single transistor means having a conductive path coupled intermediate said power supply and a reference

voltage and further having a control terminal, a control signal applied to said control terminal controlling the conductivity of said conductive path and therefore controlling the application of said power signal to said piezoelectric element as a driving signal, said conductive path of said transistor means being coupled to said power supply at a junction terminal;

D. transformer means having a primary winding and a secondary winding, said primary winding being electrically coupled intermediate said junction terminal and said piezoelectric element for detecting a detected signal representative at least of the frequency of said driving signal; and

E. tuned circuit means tuned to said desired frequency and formed from inductor means, and capacitor means connected in parallel with said inductor means, said transformer means secondary winding defining said inductor means, said tuned circuit means being operatively coupled between said transistor means control terminal and said reference voltage for applying a control signal to said control terminal for controlling the conductivity of said conductive path at said desired frequency in response to said detected signal to produce said driving signal at said desired frequency.

4,012,648

PROCESS FOR MANUFACTURING PIEZOELECTRIC RESONATORS AND RESONATORS RESULTING FROM SUCH PROCESS

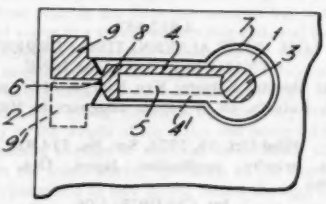
Jean Engdahl, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services S.A., Bienne, Switzerland

Filed Apr. 28, 1975, Ser. No. 571,954

Claims priority, application Switzerland, May 6, 1974, 6107/74

Int. Cl.² H01L *41/08*

U.S. Cl. 310—8.2 **12 Claims**



1. A process for the manufacture of piezoelectric resonators operable in the thickness shear mode, said process comprising the steps of:

blanking each said resonator and a single resonator support arm therefor from a plate of piezoelectric material as a single integral piece of said piezoelectric material, with said resonator being formed at one end of said support arm, said blanking step leaving each said resonator and its support arm in the plane of, but separated from, the plate from which it is blanked, except for a region of reduced cross section whereat the support arm remains attached to, but breakably detachable from the plate;

applying electrodes to said resonators and conductors to said support arm; and

breaking said resonators and their support arms from said plate at said region of reduced cross section, after applying said electrodes and conductors.

4,012,649

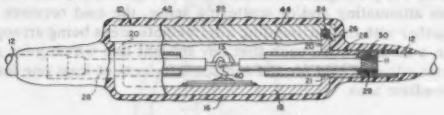
PIEZOELECTRIC STRESS/STRAIN INTRUSION DETECTORS

John C. Cook, Dallas, and James D. Kerr, Allen, both of Tex., assignors to Teledyne Industries, Inc., Dallas, Tex.

Filed Oct. 9, 1975, Ser. No. 621,110

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.3 **6 Claims**



1. A detector suitable for use in an array to be buried below the surface of the earth and connected by coaxial cable means to circuitry to detect intrusions which apply downward pressures to said surface above the array, comprising:

a. a metallic cup having an enclosing side wall portion open at one end and closed at the other end by a diaphragm portion, the side wall portions having one or more cable-receiving openings therethrough;

b. cap means closing said open end of the cup;

c. piezoelectric transducer disc means having oppositely poled electrodes and one of the electrodes of said disc means being conductively bonded to the diaphragm portion inside the cup for deformation of the disc means therewith when the diaphragm portion is flexed by said pressures;

d. said cable means passing into the cup via a side wall opening, and the cable means having an outer conductor conductively coupled to the cup and having an inner conductor coupled to the other of said oppositely poled electrodes inside the cup;

e. strain relief means comprising a hollow ferrule extending through each opening and fixed in the side wall of the cup and leading thereinto, and the cable means passing through a ferrule and fixed thereto; and

f. sealing means for sealing the cup and the portions of the cable means entering said ferrules against entry of moisture.

4,012,650

DICED SUBSTRATE S.A.W. DEVICE FOR BULK WAVE ATTENUATION

Ronald George Pratt, Reigate; Richard Stevens, Copthorne, and Alojzy Karr, Shoreham by-Sea, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

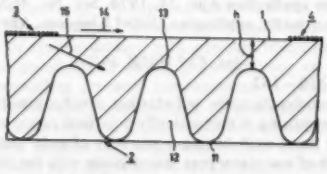
Filed Aug. 29, 1974, Ser. No. 501,482

Claims priority, application United Kingdom, Sept. 4, 1973, 41479/73

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H01L *41/04*

U.S. Cl. 310—9.6 **13 Claims**



1. An acoustic surface-wave device comprising a body in the form of a wafer having a layer extending under a first major surface and made of a piezoelectric material, which first

major surface serves as a propagation surface for the acoustic surface waves, a transducer coupled to said first major surface for converting an electric signal into a surface wave or conversely, and a plurality of discrete recesses being formed in and distributed over at least a portion of the second major surface of the wafer, which recesses extend into the wafer to a distance from the first major surface such that propagation of the acoustic surface waves is substantially unaffected whereas propagation of bulk waves is significantly affected in an attenuating and/or scattering sense, the said recesses together with the surrounding intermediate areas being arranged in a configuration such that any straight line which joins any two edges of said second surface intersects at least one intermediate area.

4,012,651

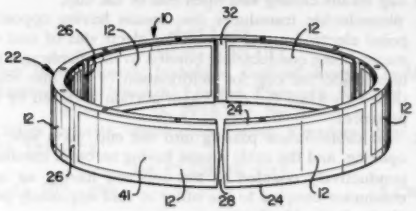
PERMANENT MAGNET FIELD MEANS FOR DYNAMO-ELECTRIC MACHINES

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Dec. 20, 1974, Ser. No. 534,856

Int. Cl.² H02K *21/22*

U.S. Cl. 310—153 **6 Claims**



1. A unitary self-sustaining magnet ring for use in a dynamoelectric machine and adapted to being secured to a surrounding supporting ring, said magnet ring comprising a non-magnetic annular carrier, and a plurality of arcuate magnets disposed in spaced end-to-end relationship relative to one another in an annular array and fixedly embedded in said carrier, said carrier being continuous along its full circumference except for having a single axially extending gap passing completely therethrough and which gap is located within the space between two of said magnets, said gap having a double wedge shape with minimum thickness near the axial center of said ring so as to accommodate a wedge driven into said gap from either side of said ring.

4,012,652

UNIDIRECTIONAL SELF-STARTING ELECTRICAL MOTORS WITH SHADED POLES AND SHADED MAGNETIC SHUNT

John Derek Gilbert, Harlow, England, assignor to Electrical Remote Control Company, Ltd., England

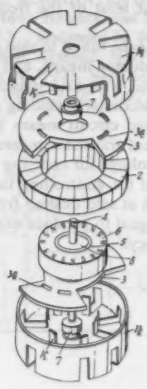
Continuation-in-part of Ser. No. 402,399, Oct. 1, 1973, which is a continuation of Ser. No. 251,264, May 8, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,506

Claims priority, application United Kingdom, Apr. 26, 1973, 19988/73

Int. Cl.² H02K *19/00*

U.S. Cl. 310—162 **32 Claims**

1. A unidirectionally self-starting synchronously-operable motor comprising: a magnetically polarized rotor; and a stator with two parts each having a plurality of pole teeth wherein pole teeth of one stator part interdigitate with the pole teeth of the other stator part, shading means for shading some of said pole teeth so as to provide at least one group of shaded pole teeth and at least one group of unshaded pole teeth, with the groups so disposed around the stator that in proceding around the stator a plurality of times there is encountered an alternate sequence comprising a group of shaded pole teeth followed by a group of unshaded pole teeth, said at least one group of shaded pole teeth being angularly spaced in the direction of rotor rotation from a symmetrical position relative to said at least one group of unshaded pole teeth, the number *n* of stator pole teeth being an integer substantially equal to 360 divided by the mean pole pitch angle which exists within the majority of the pole sets within the groups, that number n being accommodated by virtue of the pole teeth at the traling end of the at



least one group of shaded pole teeth and at the leading end of the at least one group of unshaded pole teeth having circumferential widths and angular displacements relative to the other pole teeth such that each pole tooth is accommodated between, and without contact with, its two adjacent pole teeth, the number of said groups being x such that the number of pole teeth in any of said groups being an integer in the range from $n/x - 1$ to $n/x + 1$, and a shaded magnetic shunt added to at least one group of shaded pole teeth extending substantially from one of said stator parts towards the other.

4,012,653

LOW NOISE ALTERNATING CURRENT DYNAMOELECTRO MACHINE

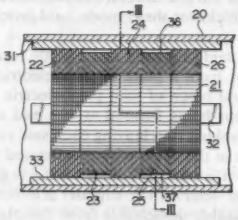
Masayuki Shigeta, Katsuta; Ken Ichiryu, Mito, and Masaki Miura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,924

Claims priority, application Japan, Oct. 17, 1973, 48-115896

Int. Cl.² H02K *1/06*

U.S. Cl. 310—217 **12 Claims**



1. An AC dynamoelectro machine comprising at least one hollow and cylindrical magnetic core consisting of a stack of a plurality of ring laminations of magnetic material, said core

being axially divided into a plurality of blocks, each said block being supported at a plurality of positions on its surface parallel to the axis of the core, at least one of the supporting positions of a first one of adjacent two said blocks being arranged in different location to those of a second one of said adjacent two blocks along the circumference of the core, said first and second blocks being closely contacted with each other in the axial direction, said blocks being stacked with visco-elastic layers interposed therebetween.

4,012,654
SINGLE-PHASE SYNCHRONOUS MACHINE

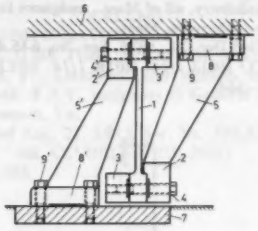
Mihailo Starcevic, Mellingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 314,576, Dec. 13, 1972, abandoned. This application June 4, 1974, Ser. No. 476,221

Claims priority, application Switzerland, Dec. 24, 1971, 18902/71

Int. Cl.² H02K *1/12*

U.S. Cl. 310—258 **3 Claims**



1. A support structure for the stator component of a synchronous electrical machine comprising a plurality of spring brackets interconnecting said stator and a base plate, each said spring bracket including one set of parallel spaced stiffening ribs projecting from the stator in the direction towards but terminating short of said base plate in a spring-connecting end and a second set of parallel spaced stiffening ribs projecting from said base plate in the direction towards but terminating short of said stator in a spring-connecting end, and leaf spring means extending in a direction radially of the stator axis and connected respectively at the opposite ends thereof to said spring-connecting ends of said first and second sets of stiffening ribs, said leaf spring means being statically stressed in tension only by the weight of the stator and being subjected to dynamic bending stresses in response to torsional vibrations occurring in the stator during operation of the machine and which are transmitted to said spring means through said stiffening ribs that lie in the plane of flexure of said spring means and also serve to stiffen the spring brackets in the radial and axial directions of said stator component.

4,012,655
REFRACTORY METAL OXIDE REFLECTOR COATING ON LAMP ENVELOPE

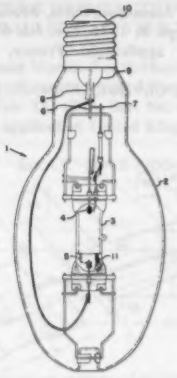
Charles I. McVey, Shaker Heights, and O. Manuel Uy, Cleveland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 546,224, Feb. 3, 1975, which is a division of Ser. No. 404,178, Oct. 9, 1973, Pat. No. 3,879,625. This application Aug. 4, 1975, Ser. No. 601,859

Int. Cl.² H01J *7/24*

U.S. Cl. 313—27 **10 Claims**

1. A fused silica envelope having an optically reflective coating of Al_2O_3 particles adherent thereto by means of an adhesion layer consisting of colloidal aluminum oxide and



boric oxide heat-reacted with the silica surface, said Al_2O_3 particles being heat-reacted with said adhesion layer.

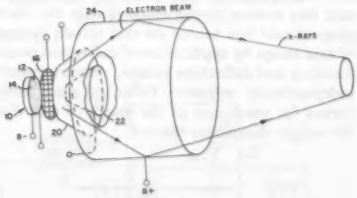
4,012,656
X-RAY TUBE

Ralph L. Norman, 3644 Marymont Drive NW., Huntsville, Ala. 35810; Jerry W. Hagood, 307 Mountain Gap Road SE., Huntsville, Ala. 35803, and Joe Shelton, 700 Tatom St. NW., Huntsville, Ala. 35805

Filed Dec. 9, 1974, Ser. No. 530,893

Int. Cl.² H01J *35/00*

U.S. Cl. 313—55 **5 Claims**



1. In an x-ray tube for generating x-ray emission, the improvement comprising: a composite field-effect electron emitter having several million insulated emitting fibers per square centimeter of emitter surface with adjacent fibers being substantially in parallel and disposed for emitting an electron beam at prevailing ambient temperatures; a target anode disposed for electron bombardment by said emitter and for releasing x-ray in response to said electron bombardment; and a control grid disposed adjacent said emitter fibers between said emitter and said target anode for varying an electric field between said emitter and said anode and thereby control field-effect electron emission; said emitter being shaped in conjunction with the shape of said anode for stimulating directional x-radiation uniformly across the anode region of bombardment.

4,012,657

SLIT-SCANNING IMAGE CONVERTER TUBE

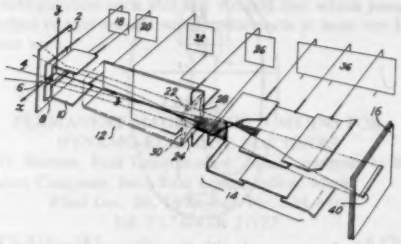
Charles Loty, Limeil-Brevannes, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 8, 1975, Ser. No. 611,198

Claims priority, application France, Sept. 13, 1974, 74.31136

Int. Cl.² H01J *39/04, 39/18*

U.S. Cl. 313—99 **9 Claims**



1. A slit-scanning image converter tube for the observation of rapidly varying light phenomena by scanning on a screen the image of a line source of electrons, said tube being constituted by a photocathode which collects the light coming from a light phenomenon to be studied and emits an electron beam, at least one control electrode having a slit for defining said line source of electrons in cooperation with said photocathode and for gating said line source by means of an applied control potential, at least one accelerating electrode, said screen, an electron-optical system for deflecting and focusing the electron beam and located between the accelerating electrode and said screen, wherein according to the invention said electron-optical system comprises:

astigmatic electron-optical lens means for focusing an image of said line source having resolution in the longer dimension of said line source on said screen and having no line of focus for resolution in the shorter dimension of said line source in the vicinity of said screen;

unidimensional focusing and deflecting means for focusing and deflecting said beam in the direction, parallel to said screen, of the shorter dimension of said line source, said focusing and deflecting means being located between said astigmatic lens means and said screen and cooperating with said astigmatic lens means for focusing an image of said line source having resolution in the shorter dimensions of said line source on said screen during deflection of said image by application of deflection potential to said focusing and deflection means, without disturbance of an independently adjusted focus of said astigmatic lens means for resolution of the image of said line source in the longer dimension thereof.

4,012,658

ELECTRIC LAMPS MOUNTED IN A FLANGED CAP

Arthur Samuel Vause, London, England, assignor to Thorn Electrical Industries Limited, London, England

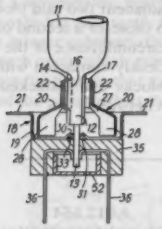
Filed Nov. 26, 1975, Ser. No. 635,363

Claims priority, application United Kingdom, Nov. 28, 1974, 51636/74

Int. Cl.² H01J *5/48, 5/50*

U.S. Cl. 313—318 **3 Claims**

1. An electric lamp comprising an envelope containing a light source, said envelope having a press seal and supply leads entering the envelope through the press seal, said lamp further comprising a metal cap, said cap having an integral peripheral flange, a support mounting said envelope on said cap, said support being attached to the press seal of the envelope, and current leads passing through openings in said cap and hermetically sealed in said openings by electrically insulating material which insulates said leads from said cap.



4,012,659

METHOD OF FLASHING TUNGSTEN FILAMENT

Edmund M. Passmore, Wilmington; George L. Duggan, Bedford; Warren A. Anderson, Danvers, and William M. Labadini, Salisbury, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 31, 1975, Ser. No. 645,486

Int. Cl.² H01J *1/16;* **H01K** *1/14;* **H01J** *19/10*

U.S. Cl. 313—344 **1 Claim**

1. In an incandescent lamp tungsten wire coiled filament the ends of which are attached to lead-in support wires, the improvement which comprises the filament having a recrystallized structure that extends closer to the support wires than the breadth of each support wire.

4,012,660

SIGNAL PLATE FOR AN ELECTRIC STORAGE TUBE OF HIGH WRITING SPEED

Reinhard Losehand; Wolfgang Welsch, and Werner Veith, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

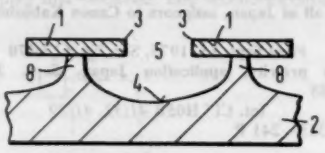
Continuation of Ser. No. 130,880, April 5, 1971, abandoned. This application Feb. 21, 1973, Ser. No. 334,361

Int. Cl.² H01J *29/41, 29/36*

U.S. Cl. 313—391 **2 Claims**

1. An electron beam charge storage device comprising a target structure, means for generating and directing an electron beam over one face of said target, said target comprising a plurality of storage elements providing storage surfaces lying in a first plane and insulated from each other and capable of holding a charge in response to electron bombardment, support means for said storage elements provided on the opposite side of said first plane with respect to said means for generating said electron beam, said support means comprising a substrate comprising individual extending support pillars for

each of said storage elements in which the cross section of said support pillars is of a smaller area than said storage surface, said support means providing an electron collecting means



lying in a second plane space from said first plane of storage surfaces, said collecting means on the opposite side of said first plane with respect to said means for generating an electron beam.

4,012,661

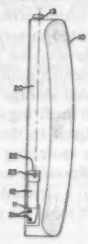
THERMAL COMPENSATION FOR COLOR TELEVISION PICTURE TUBE APERTURE MASK

Nels Danielson, Jr., Liverpool, and William H. Nicklas, N. Syracuse, both of N.Y., assignors to General Electric Company, Portsmouth, Va.

Filed Aug. 22, 1973, Ser. No. 390,533

Int. Cl.² H01J *29/07, 29/82*

U.S. Cl. 313—405 **3 Claims**



1. In a color television picture tube having a faceplate, a skirt extending from said faceplate, and an aperture mask, said aperture mask being situtated within said tube behind said faceplate and supported by a four-sided frame, apparatus to compensate said tube for expansion of said aperture mask therein due to a temperature rise of said mask so as to maintain registration between apertures in said mask and predetermined regions on said faceplate, said apparatus comprising:

first and second temperature responsive means attaching said frame to the faceplate skirt at each of two points on said skirt situated such that each of said two points is located along a horizontal axis situated below the horizontal centerline of said frame and is coupled to an opposite one of the four sides of said frame below said axis, respectively, each of said temperature responsive means tending, for any given rise in temperature thereof during normal operation of said tube, to thrust the side of said frame to which it is respectively attached toward said faceplate be a predetermined distance; and

third temperature responsive means attaching a third one of the four sides of said frame to said faceplate skirt at a third point on said skirt, said third temperature responsive means tending, when experiencing said given rise in temperature, to thrust said third one of the four sides of said frame towards said faceplate by a distance other than said predetermined distance.

4,012,662

COMMUNICATION SYSTEM BETWEEN A TRANSMITTER, RECEIVER STATION AND A MOBILE STATION UTILIZING UNIDIRECTIONAL AMPLIFIERS BETWEEN PARALLEL RADIATED TRANSMISSION LINES

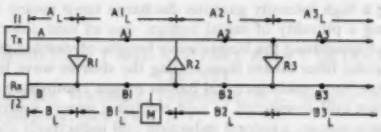
David James Reginald Martin, Leatherhead, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 13, 1976, Ser. No. 657,879

Claims priority, application United Kingdom, Mar. 7, 1975, 09567/75

Int. Cl.² H04B *3/00*

U.S. Cl. 325—28 **5 Claims**



1. A telecommunication system of the kind in which signals can be transmitted from a base transmitter station to a mobile station and signals from the mobile station can be transmitted to the base receiver station through a radiating transmission line, comprising a pair of radiating transmission lines extending substantially parallel to each other, one of the lines being connected to a base transmitter station and the other of the lines being connected to a base receiver station, a plurality of uni-directional amplifier elements connected between the lines at spaced intervals, alternate ones of the amplifier elements being connected to conduct in the opposite direction to adjacent amplifier elements, and routing means connected in the transmission lines between connections of said amplifier elements for routing signals along the lines alternately whereby a signal originating from said base transmitter station or a mobile station in the vicinity of said transmission line is routed to travel along part of a first of the lines and then through a part of the second of the lines with the transfer between the lines being effected through one of the amplifier elements.

4,012,663

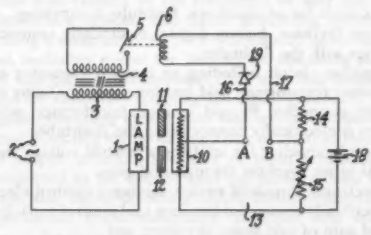
LIGHTING CONTROL SYSTEM

Trasimond A. Soileau, Flat Rock, N.C., assignor to General Electric Company, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,860

Int. Cl.² H05B *37/00*

U.S. Cl. 315—151 **5 Claims**



1. Lighting control device comprising, in combination, a source of electrical power, gaseous discharge lamp means connected to said electrical power source for operation thereby, power control means comprising electrical ballast means connected between said electrical power source and said lamp means, said lamp means being subject to variation in the spectral composition of its illumination output, and illumination control means for compensating for said spectral variation, comprising a photocell exposed to the illumination from

said lamp means and having an electrical characteristic which varies in response to the varying intensity of the light incident thereon, first and second color filter means respectively arranged between said lamp means and different portions of said photocell, and being respectively transparent to different spectra of the illumination from said lamp means, said different portions of said photocell varying in said electrical characteristic relative to one another upon variation of the intensity of the spectra incident respectively thereon, and circuit means connected to said photocell and said power control means and responsive to the variations in said photocell electrical characteristics for actuating said power control means to vary the power applied to said lamp means for maintaining the spectral output thereof substantially constant, said lamp means comprising a high intensity gaseous discharge lamp means incorporating a plurality of metal vapors, one of said color filter means transmitting the longer wave lengths of visible light and other color filter means transmitting the shorter wave lengths of visible light, said electrical ballast means comprising a first induction coil connected to said electrical power source and said lamp means, a second induction coil inductively coupled to said first induction coil, switch means connected in series with said second induction coil, and actuating means connected to said illuminating control means for operating said switch means.

4,012,664

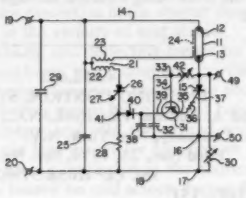
IGNITION ARRANGEMENT FOR AN ELECTRONIC FLASHTUBE

Rolf Dietrich, Hofheim, and Egon Gahler, Frankfurt-Zeilsheim, both of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Germany

Filed Sept. 25, 1975, Ser. No. 616,814

Int. Cl.² H05B *41/32*

U.S. Cl. 315—241 P **8 Claims**



1. A circuit for an electronic flashtube comprising:

a series thyristor, having a gate, electrically connected in series with the flashtube;

an ignition circuit including an ignition capacitor and an ignition transformer, said ignition capacitor being electrically connected to said ignition transformer, which in turn is electrically connected to the flashtube;

a control capacitor for applying a control voltage signal to said series thyristor through said gate;

an electronic threshold switch, having a control electrode, electrically connected between said control capacitor and said gate of said series thyristor; and

switching means including impedance means electrically connected between said flashtube and said control electrode of said electronic threshold switch so that current from the flashtube flows through said impedance means and for applying a biasing signal to said control electrode of said electronic threshold switch thereby rendering said electronic threshold switch conductive and thereby applying said control voltage signal from said control capacitor to said series thyristor for a predetermined time after a predetermined current is reached in the flashtube.

4,012,665

ELECTRONIC FLASH DEVICE WITH CAPACITOR DISCHARGE CUT-OFF BEFORE FULL DISCHARGE

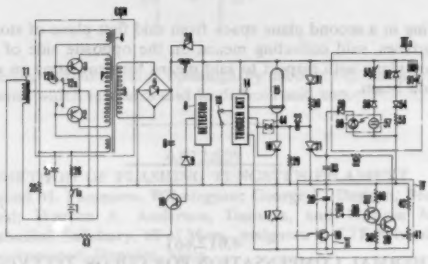
Zenzo Nakamura, Urawa; Tokuichi Tsunekawa, Yokohama; Shohei Ohtaki, Machida, and Takashi Uchiyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Sept. 15, 1975, Ser. No. 613,470

Claims priority, application Japan, Sept. 24, 1974, 49-110088

Int. Cl.² H05B *41/32, 41/29*

U.S. Cl. 315—241 P **4 Claims**



1. An electronic flash system for illuminating an object comprising;

a. a photosensitive element for producing a first control signal in response to a predetermined amount of light incident on said photosensitive element,

b. a storage capacitor,

c. a first semiconductor switching device including a control electrode and two main current carrying electrodes,

d. a flash tube connected in series with said first semiconductor switching device, the series circuit of said flash tube and said first semiconductor switching device being connected across said storage capacitor,

e. a first trigger circuit for firing said flash tube and applying a closing trigger signal to the control electrode of said first semiconductor switching devices,

f. a control circuit, responsive to the voltage of said storage capacitor attaining a critical flash light emission stop voltage of said flash tube, for producing a second control signal, and

g. a second trigger circuit connected between said first semiconductor switching device and said control circuit and responsive to said first and second control signals for bringing said first semiconductor switching device into the non-conducting state.

4,012,666

METHOD OF AND DEVICE FOR THE REMOVAL OF ELECTROSTATIC CHARGES

Jürgen Schramm, Norderstedt; Klaus Witter, Hamburg, and Gerhard Krekow, Schenefeld, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,660

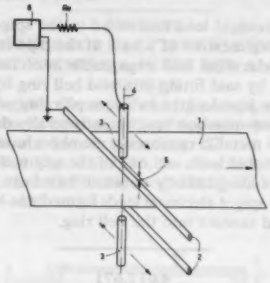
Claims priority, application Germany, July 22, 1972, 2236083

Int. Cl.² H05F *3/06*

U.S. Cl. 361—213 **2 Claims**

1. Apparatus for removing electrostatic charges from the surfaces of an insulating foil moving along a path of travel comprising, a treatment zone adjacent the travel path of the foil comprising first and second gas plasma generators for generating first and second glow discharges in air and oppositely disposed on opposite sides of the foil travel path, each plasma generator comprising a first wire electrode parallel to the plane of the foil as it passes through the treatment zone and perpendicular to the travel path, the first wire electrodes

of each plasma generator being disposed parallel to one another and spaced apart to allow the passage of the foil therebetween, each plasma generator further comprising a second wire electrode spaced apart from and perpendicular to the corresponding first electrode, said second electrodes being



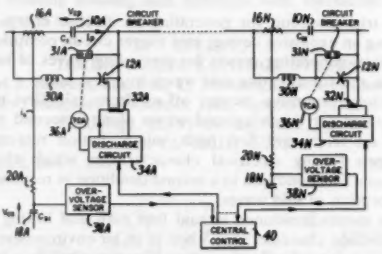
movable in synchronism in a direction parallel to the longitudinal axes of the first electrodes, and means for applying a voltage across the first and second electrodes of each plasma generator of a value to produce a uniform glow discharge composed of a neutral gas plasma adjacent said first electrodes and any foil passing through said treatment zone.

4,012,667

PROTECTIVE DEVICE FOR SERIES CAPACITOR

Yotsuo Ishida, Chofu, and Hiroshi Kuwahara, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and The Tokyo Electric Power Co., Inc., both of, Japan

Filed June 30, 1975, Ser. No. 591,395
Claims priority, application Japan, July 10, 1974, 49-79372
Int. Cl.² H02H 7/16
U.S. Cl. 361—16 **3 Claims**



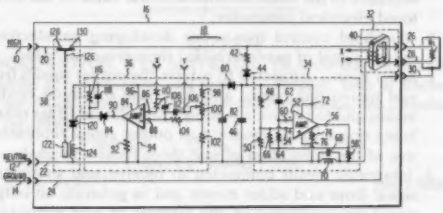
1. A protective device for a series capacitor comprising, in combination, a series capacitor, first current transformer means connected in series with said capacitor for sensing a current flowing through said series capacitor, an electric valve electrically connected in parallel with the series combination of said series capacitor and said first current transformer means and including a trigger electrode, a normally open circuit breaker energizable to close and electrically connected in parallel with said electric valve, an overvoltage sensor circuit responsive to an output from said first current transformer means in excess of a predetermined magnitude to deliver a signal, and second current transformer means having a secondary side connected to said trigger electrode of said electric valve, said second current transformer means being responsive to said signal from said overvoltage sensor circuit to simultaneously energize said electric valve to conduct and said circuit breaker to close to bypass said series capacitor and to electrically isolate a low potential portion of the protective device including said overvoltage sensor circuit from a high potential portion of the protective device including said series capacitor and said electric valve.

4,012,668

GROUND FAULT AND NEUTRAL FAULT DETECTION CIRCUIT

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 368,662, June 11, 1973, abandoned.
This application Dec. 20, 1974, Ser. No. 534,915
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976
Int. Cl.² H02H 3/28
U.S. Cl. 361—44 **3 Claims**



1. A circuit for detecting neutral faults and ground faults and for providing power interruption in response thereto, said circuit comprising:

first, second and third conductors respectively adapted for connection to the line bus, neutral bus and ground bus of an a.c. power distribution system;

a core of magnetically permeable material having a conductor wound about at least a portion of said core material, said first and second conductors being passed through said core;

a signal generating means for providing a signal at a particular frequency, said particular frequency being asynchronous with respect to the frequency of said a.c. power distribution system, said signal generating means comprising a differential amplifier configured as an oscillator and including means for deriving an operating potential for said differential amplifier from said first conductor;

means for resistively coupling the signal generated by said signal generating means onto said second conductor;

a signal detecting means having a pair of input terminals and an output terminal, said pair of input terminals being connected to the ends of said conductor wound on said core, said signal detecting means further comprising an operational transconductance amplifier and including means for deriving an operating potential for said operational transconductance amplifier from said first conductor; and

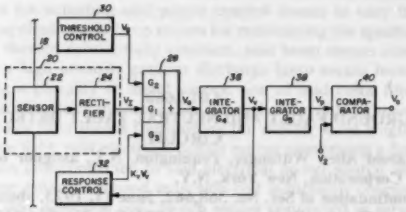
a line interrupter means connected between said signal detecting means output terminal and said first conductor for interrupting the flow of power through said first conductor in response to the signals generated in said core winding;

said core winding having signals induced therein in the event of a ground fault or a neutral fault in said power distribution system.

4,012,669
ELECTRONIC OVERLOAD DETECTING DEVICE

Peter C. Gelfand, Lebanon, and Clifford A. Mason, Hummelstown, both of Pa., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Aug. 29, 1975, Ser. No. 608,865
Int. Cl.² H02H 3/08
U.S. Cl. 361—97 8 Claims



1. A device for determining the occurrence of an electrical overload in an electrical system comprising:

a. means for monitoring an electrical parameter in an electrical system and for generating an output signal representative of the instantaneous absolute value of the monitored electrical parameter;

b. threshold control means for developing an electrical output signal of predetermined time-invariant value;

c. adder means connected to receive the output signals from said monitoring means and from said threshold control means and to receive a feedback signal, said adder means being operative to generate an output signal representative of the summation of said three received signals;

d. integrator means connected to receive said summation signal from said adder means and to generate an output signal representative of the integral of said summation signal;

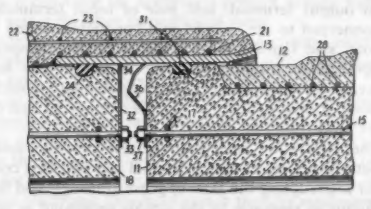
e. feedback means coupled between the output of said integrator means and the input to said adder means for feeding said integrated signal back to said adder means with a predetermined gain; and

f. comparator means connected to receive the integrated signal from said integrator means and operative to generate an indicative overload signal whenever the magnitude of said integrated signal exceeds a second predetermined value.

4,012,670
PROTECTING REINFORCED CONCRETE PIPE LINES FROM LIGHTNING DAMAGE

John A. Shaw, Sandton, South Africa, assignor to Interpace Corporation, Parsippany, N.J.

Filed May 12, 1975, Ser. No. 576,301
Int. Cl.² H02H 3/22
U.S. Cl. 361—117 3 Claims



1. A reinforced concrete pipe line comprising in combination:

a plurality of pipe lengths each having a metallic bell ring at one end and a spigot at the other end thereof,

the bell ring of one of the pipe lengths adapted to receive the spigot of a next of the pipe lengths fitted therein,

each of the pipe lengths having at least one metallic reinforcing member extending from a bell end in the vicinity of its bell ring to a spigot end in the vicinity of its spigot,

a bell electrical lead joining the bell end of the reinforcing member of one of the pipe lengths to the metallic bell ring thereof,

a spigot electrical lead connected to the spigot end of the reinforcing member of a next of the pipe lengths,

the spigot electrical lead engageable into contact with the bell ring by said fitting into said bell ring by said spigot,

each of the pipe lengths having a plurality of the metallic reinforcing members spaced peripherally thereabout,

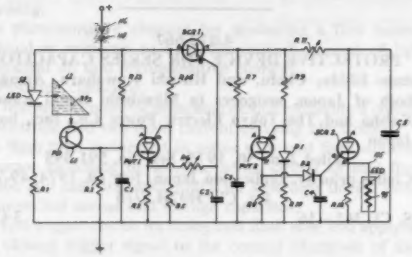
each of the metallic reinforcing members having one of the bell electrical leads and one of the spigot electrical leads each extending radially outward therefrom,

each of the spigot electrical leads formed as a bow spring for improved contact into the bell ring.

4,012,671
TRIGGER CIRCUIT

Peter Julian Vaice, Yorba Linda, Calif., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,924
Int. Cl.² F23Q 7/02
U.S. Cl. 361—249 2 Claims



1. A trigger circuit for generating an electric charge for exploding an explosive device, said trigger circuit comprising:

radiation generating means for generating waves of radiation and for directing said waves in a first path,

radiation responsive means, off-set from said first path, coupled for receiving said waves along a second path, off-set from said first path, said radiation responsive means having electrical characteristics which change from a first condition to a second condition in response to reception of said waves,

prism means positioned in said first path and having first reflection characteristics when in an air environment and having second reflection characteristics when in a liquid environment, said second reflection characteristics for converting said first path into said second path with respect to said generated waves,

a first timing circuit coupled to said radiation responsive means and driven by said radiation responsive means, for timing a first time interval, said first timing circuit including a first RC network,

first normally closed gate means coupled to and controlled by said first RC network for opening said first gate means upon said first timing circuit completing timing of said first time interval,

said first gate means coupled to a second RC network for forming a second timing circuit for timing a second time interval, and coupled to a third RC network for generating and storing an electric firing charge during timing of said second time interval,

second normally closed gate means coupled to and controlled by said second RC network for opening said sec-

ond gate means upon said second timing circuit completing timing of said second time interval, and

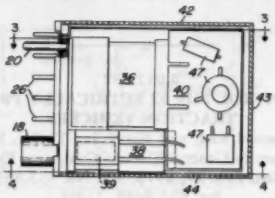
said third RC network coupled to said second normally closed gate means, said second gate means for controlling application of said generated electric firing charge to said explosive device upon opening of said second gate means upon said second timing circuit completing timing of said second time interval.

4,012,672

PLUG-IN MODULE FOR ELECTRONIC DEVICE HAVING COMPONENT FORMING A GUIDE FOR ALIGNING THE MODULE

Larry V. Douglass, Coconut Creek; Jerome Leonard, Plantation, and Morris L. Minch, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1975, Ser. No. 563,418
Int. Cl.² H05K 5/02; H02B 1/10
U.S. Cl. 361—422 10 Claims



1. A plug-in module for an electronic device having a chassis with a socket for receiving the module, including in combination:

a header having conductors extending therethrough, with portions of said conductors extending from said header and forming plug-in terminals,

a substrate having electronic components thereon connected to said conductors,

one of said components having a portion extending through said header and forming a guide to align the module with the socket on the chassis, and

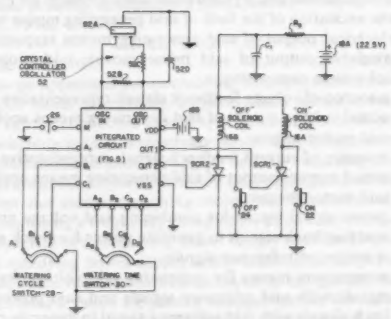
a housing housing said substrate with electronic components thereon.

4,012,673

TIMING VALVE CONTROL SYSTEM

Myrl J. Saarem, and Dale C. Firebaugh, both of Carson City, Nev., assignors to Richdel, Inc., Carson City, Nev.

Filed Sept. 15, 1975, Ser. No. 613,078
Int. Cl.² H01H 47/18
U.S. Cl. 361—196 12 Claims



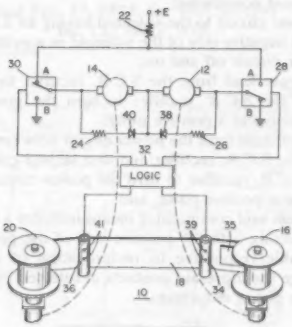
1. A control system including: electronic circuitry including first output terminal means and second output terminal means; first manually settable switching means connected to said electronic circuitry for causing said circuitry to produce a first output pulse at said first output terminal means at spaced time intervals as established by the setting of said first manually settable switching means; second manually settable switching means connected to said elctronic circuitry for causing said circuitry to produce a second output pulse at said second output terminal means a predetermined time after each of the first output pulses as established by the setting of said second manually settable switching means; said electronic circuitry including a first frequency divider counter, means including first decoder circuit means coupled to the first frequency divider counter and to the first manually settable switching means for providing said first output pulses at said first output terminal means and for applying a reset pulse to said first frequency divider counter; a second frequency divider counter; enabling circuit means connecting said first output terminal means to said second frequency divider counter to enable said second frequency divider counter when said first output pulse is produced at said first output terminal means; means including second decoder circuit means coupled to said second frequency divider counter and to said second manually settable switching means for producing said second output pulse at said second output terminal means and for applying a reset pulse to said second frequency divider counter; and an oscillator coupled to the first and second frequency divider counters for establishing a time base for the output pulses produced at the first and second output terminal means.

4,012,674

DUAL MOTOR WEB MATERIAL TRANSPORT SYSTEM

Merlin D. Spitsbergen, and James G. Hughes, both of Rochester, Mich., assignors to Computer Peripherals, Inc., Rochester, Mich.

Filed Apr. 7, 1975, Ser. No. 565,593
Int. Cl.² B65H 77/00
U.S. Cl. 318—7 24 Claims



1. A bidirectional web material transport system comprising:

first and second electric motors electrically excited in series to rotate in the same direction, one of said motors being torque producing and the other speed determinative;

first and second reels mechanically coupled to said first and second motors respectively for transferring web material therebetween;

circuit means for applying excitation voltages to said motors;

coupling means for coupling the back EMF of said first motor additively with the excitation voltage applied to said second motor to vary the total excitation voltage applied to said second motor in accordance with the instantaneous ratio of the radii of web material on said first and second reels and to maintain a greater total excitation voltage on said torque producing motor than on said speed determinative motor; and

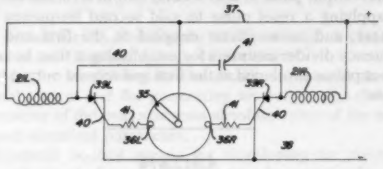
switching means for reversing the excitation voltages applied to said first and second motors when a predetermined length of web material is transferred from one of said reels to the other of said reels such that said motors are caused to reverse their direction of rotation and such that the back EMF of said second motor is additively combined with the excitation voltage applied to said first motor in accordance with the instantaneous ratio of the radii of web material on said first and second reels, and such that the excitation voltage applied to said torque producing motor increases with increasing load and decreasing speed.

4,012,675

SWITCHING SYSTEM FOR SOLENOID RECIPROCATOR

Everett E. Schulze, Jr., 1357 Helena, Apt. 100, Aurora, Colo. 80011

Filed Aug. 4, 1975, Ser. No. 601,540
Int. Cl.² H02K *33/00*
U.S. Cl. 318—37 **7 Claims**



1. In a solenoid reciprocator motor which includes a solenoid, a piston adapted to reciprocate into and out of the solenoid, direct current power means to power the solenoid and commutator means rotating in unison with the reciprocation of the piston to apply power to the solenoid at intervals such as to drive the piston in its reciprocatory movement, the improvement comprising:

a. a power circuit to the solenoid having an S.C.R. rectifier at the negative side of the solenoid as a switch to turn the power circuit off and on;

b. a trigger lead from the S.C.R. rectifier to a contact to close the S.C.R. rectifier to turn the power circit on responsive to a positive pulse;

c. a cutoff lead from the power circuit between the solenoid and the S.C.R. rectifier and to a second contact to open the S.C.R. rectifier to turn the power circuit off responsive to a positive pulse; and

d. wherein said commutator means includes a rotatable arm connecting with the positive side of the power lead and rotatable responsive to reciprocation of the piston to engage the aforesaid contacts at selected cyclic intervals of the piston movement.

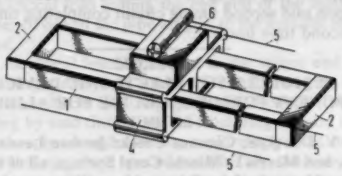
4,012,676

DEVICE FOR DRIVING RECORDERS AND PRINTING CARRIAGES IN DATA RECORDERS

Fritz Giebler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 13, 1974, Ser. No. 442,215
Claims priority, application Germany, Feb. 27, 1973, 2309750
Int. Cl.² H04L *17/30*
U.S. Cl. 318—135 **5 Claims**

1. In a device, particularly for the drive of recording or printing carriages in data recorders and the like, the combination of a linear motor, having a pair of elongated, transversely spaced ferro-magnetic rails defining a working air gap therebetween, and a current-carrying drive coil movably guided upon and encircling at least one of said rails, a magnet operatively magnetically bridging the space between said rails, with one pole thereof magnetically connected to an end portion of one of such ferro-magnetic rails and the other pole thereof magnetically connected to an end portion of the other of said rails, the latter extending from their respective connected end portions parallel to one another in relatively closely spaced



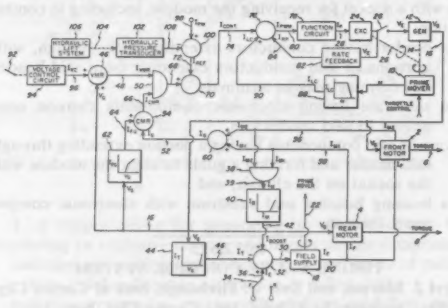
relation whereby one of said rails is of one magnetic polarity and the other of said rails is opposite magnetic polarity to produce a directional oriented field across said air gap throughout the effective operational length of said ferro-magnetic rails.

4,012,677

SPEED CONTROL FOR ELECTRICALLY PROPELLED TRACTION VEHICLES

Donald Hammond Rist, and Barry Jay Turley, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Feb. 27, 1975, Ser. No. 553,865
Int. Cl.² B60L *11/02*
U.S. Cl. 318—149 **8 Claims**



1. For use in an electrically propelled traction vehicle wherein a thermal prime mover drives electrical generating means supplying electrical energy to separately excited d-c traction motor means, a propulsion control system for controlling the excitation of the field of said generating means to limit the electrical output of said generating means responsive to the available output of said prime mover, said propulsion control system comprising:

a. a source of voltage feedback signals representative of the actual voltage output of said generating means applied to said motor means;

b. a source of current feedback signals representative of the actual current output of said generating means applied to said motor means;

c. power signal means for combining said voltage and current feedback signals to generate power feedback signals;

d. a source of reference signals;

e. comparison means for comparing said voltage feedback signals with said reference signals and said power feedback signals with said reference signal to generate control signals adapted to modify the field excitation of said generating means to limit the output of said generating means within both a predetermined maximum horsepower limit and a given voltage limit which has a predetermined maximum value;

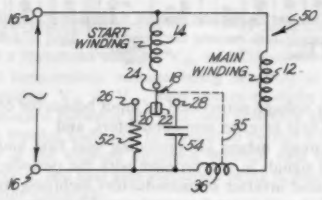
f. manually adjustable vehicle speed control means adapted to provide a voltage control signal having a magnitude representative of the setting of said speed control means;

g. speed control circuit means for coupling said voltage control signal in circuit with the means for comparing said voltage feedback and said reference signals to reduce the voltage output limit of said generating means below said predetermined maximum value as a function of the setting of said speed control means without modifying the maximum horsepower limit of the generating means.

4,012,678
STARTING CIRCUIT FOR SINGLE PHASE MOTOR

Robert F. Blaha, Dedham, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 565,031
Int. Cl.² H02P 1/44
U.S. Cl. 318—221 D **1 Claim**



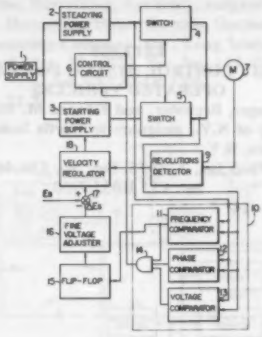
1. A starting and running circuit for a single phase alternating current induction motor having a main winding and a start winding comprising a start mode resistor adapted to be placed electrically in series with said start winding when energized, a run mode capacitor adapted to be placed electrically in series with said start winding when energized, switching means in series with said start winding to switch between and thereby energize and de-energize said start mode resistor and said run mode capacitor, and actuation means responsive to a motor condition to control said switching means.

4,012,679
METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF SYNCHRONOUS MOTOR

Yasuo Matsuda; Takeo Maeda; Kouzou Watanabe; Kazuo Honda; Hironori Okuda; Kunio Miyashita, all of Hitachi, and Yasuyuki Sugiura, Takahagi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 23, 1975, Ser. No. 543,306
Claims priority, application Japan, Jan. 6, 1974, 49-14462; Feb. 8, 1974, 49-15497
Int. Cl.² H02P 1/46
U.S. Cl. 318—167 **6 Claims**

1. In an apparatus for controlling the operation of a synchronous motor comprising a synchronous motor, a starting power supply connected to said synchronous motor through a first switching means, a steadying power supply connected to said synchronous motor through a second switching means, and a control device for controlling the opening and closing of said first and second switching means; the improvement further comprising a frequency comparator circuit for comparing the frequency of said starting power supply with the frequency of said steadying power supply and producing an output when the difference between said frequencies is not greater than a predetermined value, frequency changer means for reducing the frequency of said starting power supply when the frequency of said starting power supply exceeds a frequency level set higher than the frequency of said steadying power supply and for increasing the frequency of said starting power supply when the frequency of said starting power supply is reduced below said frequency level set higher than the frequency of said steadying power supply, a phase comparator circuit for comparing the phase of said steadying power supply with that of said starting power supply and producing an output when the difference between said phases is smaller than a predetermined value, a voltage comparator circuit for comparing the voltage of said steadying power supply with that of said start-

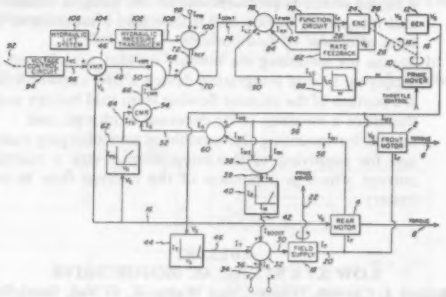


ing power supply and producing an output when the difference between said voltage is smaller than a predetermined value, and an AND circuit for producing an output and applying said output to a control device when all of said frequency comparator circuit, said phase comparator circuit and said voltage comparator circuit produce outputs.

4,012,680
FIELD BOOST ARRANGEMENT FOR SEPARATELY EXCITED D-C TRACTION MOTORS OF A VEHICLE PROPULSION SYSTEM

Norman Kingston Dickerson, Westfield, N.Y., and Barry Jay Turley, Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Feb. 27, 1975, Ser. No. 553,861
Int. Cl.² H02P 5/16
U.S. Cl. 318—338 **11 Claims**



1. In a propulsion system for traction vehicles using separately excited traction motor means comprising an armature and field winding means and wherein an electrical source provides to said armature an armature current whose magnitude can vary, means for supplying excitation to said field winding means comprising:

a. first field means to supply a substantially constant predetermined field excitation under normal operating conditions, said field excitation being of adequate magnitude such that the traction motor means is magnetically saturated so that variation of traction motor load produces only a small variation in back electromotive force;

b. boost field means for supplying additional boost field excitation to increase the torque of said traction motor means;

c. detecting means for sensing the magnitude of motor armature current; and

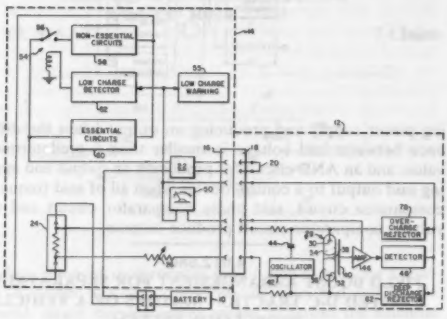
d. control means for activating said boost field excitation means solely responsive to said sensed magnitude of armature current exceeding a reference level corresponding to a predetermined high magnitude of armature current.

4,012,681

BATTERY CONTROL SYSTEM FOR BATTERY OPERATED VEHICLES

Eugene P. Finger, Brewster, and Edward M. Marwell, Mount Kisco, both of N.Y., assignors to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed Jan. 3, 1975, Ser. No. 538,466
Int. Cl.² H02J *7/00*
U.S. Cl. 320—14 **7 Claims**



1. Apparatus for monitoring the state of charge of a battery during both its charge at a charging station and its discharge during use in a vehicle, said apparatus comprising:

a. a module which is connectable to either said vehicle or said charging station;

b. an integrating device contained in said module;

c. means responsive to said integrating device for producing a signal which is proportional to the integral stored by said integrating device and is therefore a measure of the state of charge of said battery;

d. means for mounting the module on said vehicle and for supplying to said integrating device a first current which is a portion of the current flowing from said battery and is therefore a measure of its decrease in charge; and

e. means for mounting the module at said charging station and for supplying to the integrating device a resetting current which is a portion of the current flow to said battery.

4,012,682

LOW KVA STATIC AC MOTOR DRIVE

Robert J. Carroll, Warren, and Walter K. O'Neil, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 5, 1975, Ser. No. 547,150
Int. Cl.² H02M *7/00*
U.S. Cl. 321—5 **26 Claims**

1. A commutation circuit for a voltage controlled inverter that has dc input busses of nominal positive and negative polarity and inverter semiconductors periodically triggered into conduction and periodically commutated off by applying voltage of reverse polarity across the dc input busses to supply ac current to a load comprising:

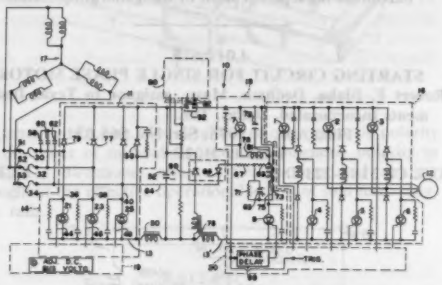
means connected with said dc input busses for supplying principal dc power of said nominal polarity thereto,

capacitance means for storing electrical energy for commutating off said inverter semiconductors,

auxiliary charging means connected with said capacitance means for charging said capacitance means to voltage of a first polarity before commutation, said auxiliary charging means comprising at least one of said dc input busses,

means connected with said capacitance means and responsive to a first control signal for resonantly reversing the polarity of voltage on said capacitance means,

switching means responsive to a second control signal to connect said capacitance means across said dc input busses after reversal of its polarity to apply reverse



polarity voltage across said dc input busses for commutation of said inverter semiconductors, and

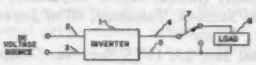
control circuit means for providing said first and second control signals in synchronism with the periodic triggering of said inverter semiconductors including means for providing said second control signal later than said first control signal so as to allow time for resonantly reversing said voltage of said capacitance means before said capacitance means is connected across said dc input busses for commutation.

4,012,683

METHOD AND APPARATUS FOR REDUCING INVERTER NO-LOAD LOSSES

Armand P. Ferro, and John P. Walden, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,419
Int. Cl.² H02M *7/515*
U.S. Cl. 321—45 R **10 Claims**



1. A method of reducing the no-load power losses of an inverter system including an inverter having a fall-back current limit during electrical short circuit conditions which is characterized by lower power losses than open circuit losses, said method comprising:

removing the load from the output terminals of said inverter; and

applying an electrical short circuit to said output terminals to terminate normal inverter operation.

4,012,684

VOLTAGE REGULATOR CIRCUIT WITH FET AND BIPOLAR TRANSISTORS

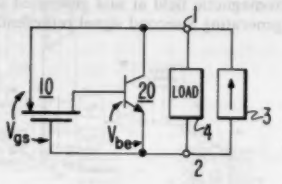
Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,557
Int. Cl.² G05F *1/00*
U.S. Cl. 323—8 **9 Claims**

1. A circuit for regulating the voltage across two terminals

between which an operating current flows comprising, in combination:

a bipolar transistor having base, emitter and collector electrodes, a path between said emitter and collector electrodes, a junction between said base and emitter electrodes and a nominal base-emitter voltage, V_{be}, said emitter-to-collector path being connected between said terminals; and



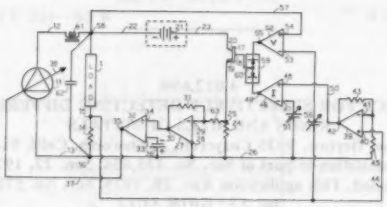
a field effect transistor having source, drain and gate electrodes, a path between said source and drain electrodes and a threshold voltage, V_{th}, said threshold voltage and said base-emitter voltage being selected to satisfy the inequality $V_{th} > V_{be}$, said source-to-drain path being connected between the base and collector electrodes of said bipolar transistor in a sense to permit a flow of current in the forward direction through said base-emitter junction, and said gate electrode being connected to said emitter electrode.

4,012,685

REGULATED POWER SUPPLY FOR VERY HIGH CURRENT WITH VOLTAGE AND CURRENT PROGRAMMABLE TO ZERO

Sarkis Nercessian, Flushing, N.Y., assignor to Forbro Design Corporation, New York, N.Y.

Continuation of Ser. No. 343,792, March 22, 1973, abandoned. This application Mar. 14, 1974, Ser. No. 451,302
Int. Cl.² G05F 1/56
U.S. Cl. 323—20 **1 Claim**



1. In a regulated DC power supply, the combination of;

a source of DC current;

means for controlling said current;

a pair of load terminals connected through a first current sensing resistor and an inductor to said source;

a controllable impedance current sink, a source of DC voltage and a second current sensing resistor all connected in series across the series circuit comprising said load terminals and the first said current sensing resistor;

voltage and current feedback means gated to control said current sink for programming the current and voltage to said load terminals;

means for keeping the current in said sink constant from the maximum output voltage which the power supply is capable of supplying down to zero output voltage including degenerative feedback means connected between said second current sensing resistor and said means for controlling said current and including said source of DC voltage;

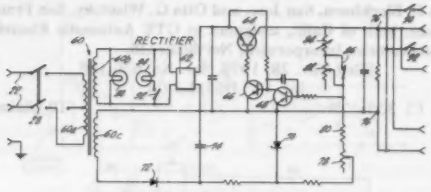
wherein said source of DC voltage is sufficient to provide said constant current to said sink at zero voltage across said load terminals.

4,012,686

POWER SUPPLY FOR ILLUMINATED INSTRUMENT

Helmut A. Heine, Herrsching, Germany, assignor to Optotechnik, GmbH, Herrsching Upper Bavaria, Germany and Propper Manufacturing Company, Inc., Long Island City, N.Y.

Filed Mar. 18, 1971, Ser. No. 125,488
Int. Cl.² A61B 1/06
U.S. Cl. 323—22 T **3 Claims**



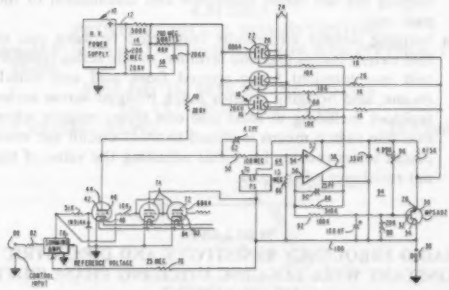
1. A power supply for illuminated medical diagnostic instruments comprising input terminals adapted to be connected to a source of alternating current, a rectifier communicating with said input terminals for rectifying said alternating current, output terminals adapted to be interconnected with one or more illuminated medical diagnostic instruments, and a control circuit communicating with said rectifier and said output terminals for variably regulating the voltage at said output terminals over a continuous normal operating range corresponding substantially to the normal operating range of the illuminating device of said instruments and for providing a discrete output voltage above said normal operating range to give extra illumination for brief periods.

4,012,687

DRIVER AMPLIFIER FOR ADJUSTABLE HIGH VOLTAGE POWER SUPPLY

Elbert P. Carter, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1975, Ser. No. 602,758
Int. Cl.² G05F 1/52, 1/56
U.S. Cl. 323—22 V **8 Claims**



1. In a high voltage direct current power supply having a source of direct current, high voltage adapted to provide an adjustable output voltage in response to an input control voltage from a source and an output circuit adapted to be connected to a load, an electron flow device, having a flow control electrode, connected in series between said output circuit and said source, and a control amplifier responsive to said control voltage for driving said control electrode, the improvement comprising:

a differential driver amplifier having a pair of inputs and an

output coupled to said control electrode and one of said inputs, means to apply a bias voltage to one of said inputs,

a voltage divider network having a tap coupled to the other of said inputs,

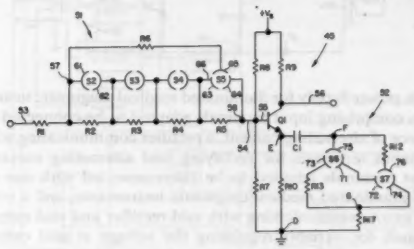
said divider network coupling the output of said control amplifier to said driver amplifier and said output circuit thereby to provide a low noise, constant voltage drop between the output of said control amplifier and said driver amplifier which permits low output voltages in said output circuit.

4,012,688

RESISTIVE PAD WITH BRIDGING RESISTOR

Tom L. Blackburn, San Jose, and Otto G. Wisotzky, San Francisco, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 28, 1975, Ser. No. 636,185
Int. Cl.² H02M *3/06*
U.S. Cl. 323—79 **10 Claims**



1. A resistive pad having an attenuation between an input and an output terminal, measured with respect to a reference point, that is variable in discrete steps and having a net resistance between the input and output terminals, comprising:

a plurality of resistors electrically connected in series between the input and output terminals;

a shunt resistor electrically connected between a series resistor and the reference point;

a plurality of switch means, each of which is electrically connected across an associated series resistor; each of said switch means being in one of two states, the state of a switch means being changed to selectively control whether an associated series resistor is short-circuited for varying the net series resistance and attenuation of the pad; and

a bridging resistor electrically connected between one of said switch means and one terminal of one series resistor, said one terminal being spaced from said one switch means, said bridging resistor being bridged across series resistors including at least said one series resistor when said one switch means is closed to short-circuit the associated series resistor for furter adjusting the value of the net resistance of the pad.

4,012,689

RADIO FREQUENCY RESISTIVITY AND DIELECTRIC CONSTANT WELL LOGGING UTILIZING PHASE SHIFT MEASUREMENT

Percy T. Cox; Richard A. Meador, and Larry W. Thompson, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

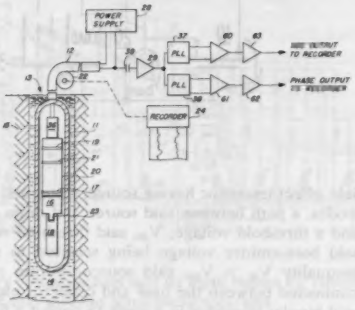
Filed Oct. 24, 1974, Ser. No. 517,704
Int. Cl.² G01V *3/10, 3/18*
U.S. Cl. 324—6 **6 Claims**

1. A method for logging well boreholes to obtain measurements functionally related to the resistivity and dielectric constant of earth materials in the vicinity thereof, comprising the steps of:

generating in a well borehole at a first location a radio frequency electromagnetic field in the frequency range from 10 to 60 megahertz;

detecting in the borehole at a second longitudinally spaced location from said first location the total electromagnetic field at said generated frequency and generating a first signal representative thereof;

detecting in the borehole at a third location longitudinally spaced from said first and second locations the total electromagnetic field at said generated signal frequency and generating a second signal representative thereof;



generating a third signal functionally related to the amplitude of the total electromagnetic field at least at one of said second or third locations as an indicator of the resistivity of the earth formations in the vicinity of the borehole;

generating from said first and second representative signals an indication of the relative phase shift of the total electromagnetic field at said generated frequency between said second and third locations; and

combining said phase shift indication and said third signal indicative of formation resistivity to derive an indication of the dielectric constant of the earth formations in the vicinity of the borehole.

4,012,690

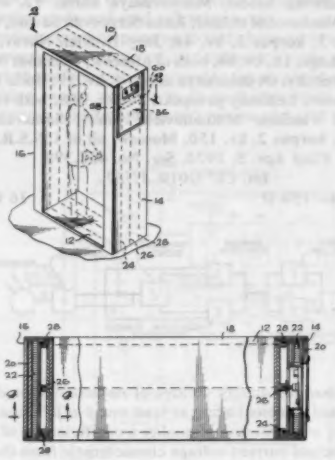
DEVICE FOR SELECTIVELY DETECTING DIFFERENT KINDS AND SIZES OF METALS

Solomon Heytow, 9535 Cozycroft, Chatsworth, Calif. 91311

Continuation-in-part of Ser. No. 435,454, Jan. 22, 1974, abandoned. This application Apr. 29, 1975, Ser. No. 572,760
Int. Cl.² G01R *33/12*
U.S. Cl. 324—41 **21 Claims**

1. A metal detecting station for detecting the movement of deliberately hidden ferrous or non-ferrous metal objects through said station comprising a transmitting coil and at least one receiving coil, said transmitting coil and said at least one receiving coil disposed in spaced relationship to each other, a signal generator connected to said transmitting coil for inducing an electromagnetic field in said at least one receiving coil, first means associated with said station for producing a fixed voltage output in said at least one receiving coil, second means in said station and associated with said first means in such a way that said second means operates only when said first means operates and induces a phase shift between the transmitting coil and said at least one receiving coil, said phase shift in a direction such that the metal-detecting station is sensitive to ferrour or non-ferrous metal objects passing through the station and sufficiently large to distort the electromagnetic field inside the metal-detecting station so that no likely combination of target-shape or target-orientation could pass through the station without disturbing the voltage in said receiving

coil, and means associated with the station and connected to said at least one receiving coil for providing an indication of



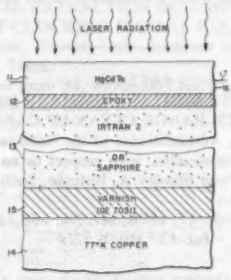
any voltage change in said at least one receiving coil caused by the passage of a metal object through the station.

4,012,691

DETERMINATION OF THERMAL IMPEDANCES OF BONDING LAYERS IN INFRARED PHOTOCONDUCTORS

Filbert J. Bartoli, Upper Marlboro, Md.; Leon Esterowitz, Springfield; Roger E. Allen, Alexandria, both of Va., and Melvin R. Kruer, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1976, Ser. No. 674,999
Int. Cl.² G01R *27/02*
U.S. Cl. 324—65 R **4 Claims**



1. A method of determining thermal constants of bonding layers of an infrared sensor that includes different layers of material which comprises:

securing said sensor onto a heat sink;

heating said sensor by a laser output source for a set time period;

subsequent to heating said sensor immediately measuring and recording the electrical resistance of said sensor;

continue measuring and recording the electrical resistance for a set period of time to establish a thermal profile of each layer of said sensor; and

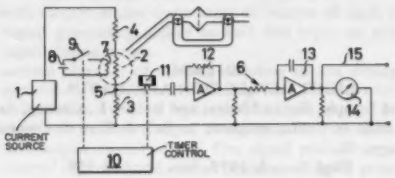
comparing said thermal profile with thermal profiles of known parameters of incident laser output, thickness of bonding layers, and same types of layer materials.

4,012,692

METHOD AND APPARATUS FOR DETERMINING THE CONCENTRATION OF ONE GASEOUS COMPONENT IN A MIXTURE OF GASES

Hartmut Eicker, Bochum, Germany, assignor to Westfalische Berggewerkschaftskasse, Bochum, Germany

Filed Sept. 12, 1974, Ser. No. 505,525
Int. Cl.² G01N *27/12, 27/14*
U.S. Cl. 324—71 SN **18 Claims**



1. A method for determining the concentration of carbon monoxide in a mixture of gases by the use of a metallic oxide semiconductor, the resistance of which changes upon exposure to gases including carbon monoxide, the exposure responsive resistance change of the metallic oxide semiconductor being temperature dependent and extending through a temperature range having an elevated temperature which regenerates the semiconductor of gases and a lower portion in which the greatest resistance change responsive to exposure to carbon monoxide occurs, said method comprising the steps of:

applying a heating cycle to the metallic oxide semiconductor to raise the temperature of the semiconductor to an elevated temperature to regenerate the semiconductor, and to reduce the temperature to the lower portion of the temperature range;

exposing the metallic oxide semiconductor at such reduced temperature as to the mixture of gases; and

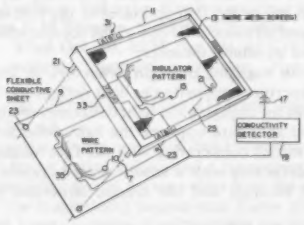
ascertaining the rate of change with respect to time in electrical resistance of the metallic oxide semiconductor produced by the exposure and thereby the concentration of the carbon monoxide component of the mixture of gases.

4,012,693

PRINTED CIRCUIT BOARD TESTING

Donald F. Sullivan, 115 Cambridge Road, King of Prussia, Pa. 19406

Filed July 16, 1975, Ser. No. 596,303
Int. Cl.² G01R *31/02, 31/08*
U.S. Cl. 324—73 PC **15 Claims**



7. Test equipment for locating wiring defects on a printed circuit wiring board having a conductive wire pattern affixed to an insulating board, comprising in combination,

a test jig with a mirror image of the wiring pattern on said

board defined by insulating materials located in place of the conductive patterns and with conducting patterns located in place of the insulating portions,

means placing in registration said test jig and said wiring board,

means contacting in registration at least a portion of the test jig with a corresponding portion of the wiring board, and

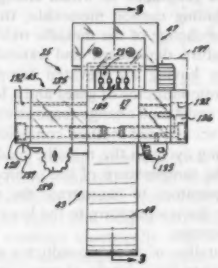
means sensing conductivity between the test jig and wiring board while in contact.

4,012,694

LIGHT DEFLECTION APPARATUS

Winfield Sample, Sierra Madre, and Robert L. Cheney, Arcadia, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 3, 1975, Ser. No. 628,159
Int. Cl.² G01R 13/38
U.S. Cl. 324—97 **22 Claims**



1. A light deflection mechanism responsive to a plurality of energizing signals to provide on display means a plurality of traces each representative to the characteristics of an associated one of the energizing signals, the mechanism comprising:

a first structural member having portions defining a plurality of first apertures;

a second structural member disposed relative to the first structural member and having portions defining a plurality of second apertures each extending in alignment with an associated one of the first apertures in the first structural member;

means for maintaining the first and second structural members in a spaced relationship;

a plurality of light deflectors each extending through an associated one of the first apertures of the first structural member and an associated one of the second apertures in the second structural member;

first means for engaging the light deflectors on the side of the first apertures opposite the light deflectors;

second means for engaging the light deflectors on the side of the second aperature opposite the light deflectors;

the second means cooperating with the first means to provide the deflectors with a tensile stress between the first structural member and the second structural member; and

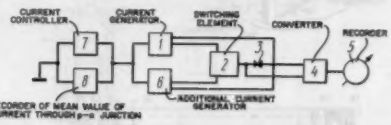
each of the light deflectors including a mirror providing a reflected light beam and a coil responsive to the associated energizing signal to deflect the coil and the mirror so that the reflected light beam provides the associated trace representative of the characteristics of the associated energizing signal.

4,012,695

METHOD AND APPARATUS FOR QUALITY CONTROL OF SEMICONDUCTOR DEVICES AND INTEGRATED CIRCUITS

Evgenia Iosifovna Model, Moskovskaya ulitsa, 12, kv. 50, Khimki, Moskovskoi oblasti; Anna Sergeevna Savina, Gospitalny val, 3, korpus 3, kv. 44; Jury Lvovich Nurov, ulitsa Chaikovskogo, 18, kv. 84, both of Moscow; Alexandr Nikolaevich Piorunsky, Orshanskaya ulitsa, 4, kv. 59; Boris Efimovich Fedorov, Leninsky prospekt, 34, kv. 368, both of Moscow, and Vladimir Mikhailovich Ivanov, Samarkandsky bulvar, 6, korpus 2, kv. 150, Moscow, all of U.S.S.R.

Filed Apr. 5, 1974, Ser. No. 458,398
Int. Cl.² G01R 31/22
U.S. Cl. 324—158 D **16 Claims**



1. A method for quality control of semiconductor devices and integrated circuits having at least one p-n junction, comprising using as a criterion of quality a coefficient m of deviation of the actual current-voltage characteristic from the ideal one lying in the range of m_{min} m m_{max}, wherein m_{min} 1, while m_{max} 2; passing a current through the p-n junction in the forward direction in the range defined by the relationship

$$I/U \quad 4\Phi_T < I < \frac{\Phi_T}{R_b},$$

wherein

U is voltage drop across the p-n junction;

ϕ is thermal potential equal to kT/q;

R_b is resistance in the base circuit of the p-n junction including the external resistance;

measuring the voltage amplitudes across the p-n junction caused by the passage of said current, said voltage increments being proportional to said coefficient m of deviation of the actual current-voltage characteristic obtained when passing said current through the p-n junction from the ideal characteristic.

4,012,696

MULTIPLE RATE DIGITAL COMMAND DETECTION SYSTEM WITH RANGE CLEAN-UP CAPABILITY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; James R. Lesh, and Stanley A. Butman, both of Pasadena, Calif.

Filed Feb. 17, 1976, Ser. No. 658,449
Int. Cl.² H04B 7/14
U.S. Cl. 325—4 **19 Claims**

1. In a μ-type ranging system which uses a sequence of composite ranging code signals transmitted by a station to a receiver having a cleanup loop that generates a synchronous reference code signal for each ranging code signal received in sequence, each reference code signal being retransmitted as a replica of each sequential ranging code signal received, a system for detecting command symbols phase modulated onto a composite ranging code signal at a command symbol rate coherently related to the symbol rate of the ranging code signal being transmitted at the time by the station, thus using the ranging code signal as a data subcarrier, thereby providing multirate data communication without dedicating a separate uplink channel, comprising

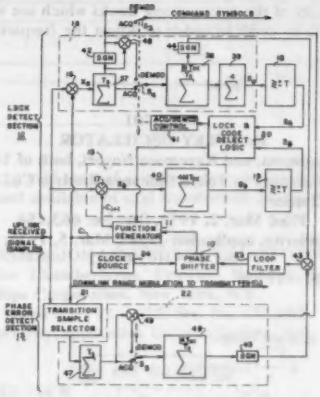
lock detection means for correlating said received code

signal with said reference code signal, and in response to correlation values produced, detecting when the inverse phase of said ranging code signal is being received,

a phase error detection means for producing an error signal proportional to the phase difference between a received ranging code and said reference code,

correcting means responsive to said phase error signal for so correcting the phase of said reference code as to phase lock the reference code signal to the received code signal,

switching means responsive to said correcting means for switching said lock detection means and said phase error



detection means to a demodulating mode of operation upon detecting said inverse phase, said demodulating mode including in said lock detection means an arrangement of means for detecting command symbols at the symbol rate of said reference code by accumulating correlation values for each symbol rate period, T_p, and deriving the sign of each correlation sum as a detected command symbol, and

means in said phase error detection means responsive to said detected command symbols for compensating detected phase error command symbol modulation on said received code signal period.

4,012,697

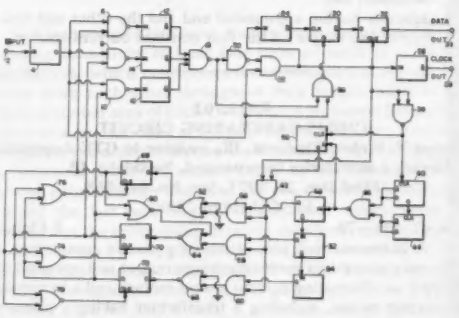
CLOCK SIGNAL EXTRACTION DURING PLAYBACK OF A SELF-CLOCKING DIGITAL RECORDING

Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 30, 1975, Ser. No. 591,342

Int. Cl.² H03K *1/17, 17/00, 5/13*

U.S. Cl. 328—63 **10 Claims**



1. A signal gating circuit comprising:

a first signal gating means having a first and a second input circuit and an output circuit,

a first plurality of signal generating means arranged to generate a plurality of differing duration output signals,

a second signal gating means having a plurality of signal gating circuits equal in number to said plurality of signal generating means with each of said signal gating circuits having a first and a second input and an output circuit connected to a one of said signal generating means,

an input terminal,

first circuit means connecting said input terminal to said first input of each of said signal gating circuits,

second circuit means connecting said input terminal to said second input circuit of said first signal gating means,

output terminal means,

third circuit means connecting said output circuit of said first signal gating means to said output terminal,

fourth circuit means connecting an output of each of said signal generating means to said first input of said first signal gating means,

a second plurality of signal generating means arranged to generate a sequence of differing time period output signals in response to an input control signal applied thereto,

fifth circuit means arranged to apply an output signal from said output circuit of said first signal gating means as a control signal to said second plurality of signal generating means,

comparator means connected to said output circuit of said first signal gating means and to said second plurality of signal generating means for comparing the time of occurrence of an output signal from said output circuit of said first signal gating means with each of said differing time period signals from said second plurality of signal generating means and for producing an output signal representative of a match between said output signal from said output circuit of first signal gating means and said differing time period signals, and

third signal gating means arranged to apply said output signal from said comparator means to said second input of a selected one of said second signal gating means as determined by the match between the signals compared by said comparator means to control an output signal from a respective one of said first plurality of signal generating means for application to said first input of said first signal gating means.

10. A method of gating a signal including the steps of comparing the time of occurrence of the signal with each of a plurality of differing period signals, producing an output signal corresponding to a match between the compared signals, applying the output signal to a respective one of a plurality of signal generating means to produce a corresponding duration output signal and applying the signal to be gated and said lastmentioned output signal to a gate circuit to control the gating of the signal to be gated through said gate circuit.

4,012,698

DEVICE FOR OBTAINING A JITTERSTABLE SYNCHRONIZATION OF A COUNTER

Stig Erik Karlsson, Vallingby, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 20, 1975, Ser. No. 623,772

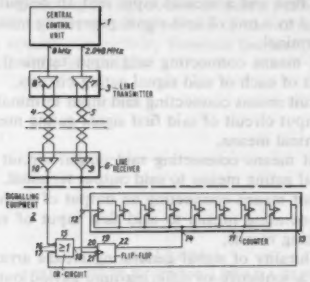
Claims priority, application Sweden, Nov. 6, 1974, 74139296

Int. Cl.² H03K *1/17, 5/13;* **H04L** *7/00*

U.S. Cl. 328—63 **3 Claims**

1. In a system having a control unit transmitting bit timing pulses and frame timing pulses, and a counter having a clock input for receiving the bit timing pulses from the control unit, an output for transmitting regenerated frame timing pulses, and a reset input, a device for jitterstable synchronizing the counter to the control unit comprising: a phase comparator means having a first input for receiving the frame timing pulses from the control unit, a second input connected to the output of the counter, and an output for transmitting an output signal if, and only if, a lag of the leading edge or a lead of

the trailing edge occurs for the frame timing pulses regenerated by the counter relative to the frame timing pulses transmitted from the control unit; and a memory means having a signal input connected to the output of said phase comparator



means, a clock input for receiving the bit timing pulses and reacting on an edge opposite to the edge on which the clock input of the counter is arranged to react, and an output connected to the reset input of the counter to reset the latter when an output signal is emitted from the phase comparator means.

4,012,699

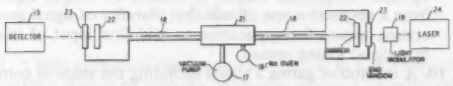
AMPLIFYING CHARACTERISTICS OF A CAVITY-ENCLOSED NONLINEAR MEDIUM

Hyatt McDonald Gibbs, Warren; Samuel Leverte McCall, Jr., Gillette, and Thirumalai Nallan Chakravarthy Venkatesan, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1975, Ser. No. 563,122

Int. Cl.² H01S *3/10*; G02F *1/28*

U.S. Cl. 330—4.3 **43 Claims**



1. A method of amplifying variations in an optical signal of a given wavelength comprising

introducing light of the given wavelength into a cavity formed by at least two surfaces that reflect light of the given wavelength, and which surfaces are separated at least in part by a positive-temperature nonlinear medium

fixing the cavity and medium characteristics such that the dispersive properties of the medium dominate or are equal to the absorptive properties of the medium at the given wavelength and such that there is a single valued relationship between the intensities of the incident and transmitted signals which exhibits gain, and

extracting the amplified signal from said cavity.

4,012,700

CAPACITIVE ADJUSTING DEVICE FOR A QUARTZ CRYSTAL OSCILLATOR

René Besson, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

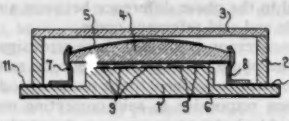
Filed Feb. 4, 1976, Ser. No. 655,240

Claims priority, application Switzerland, Feb. 28, 1975, 2545/75

Int. Cl.² H03B *5/32*

U.S. Cl. 331—116 R **3 Claims**

1. A capacitive device for adjusting the frequency of a quartz crystal oscillator, comprising a quartz crystal, an assembly of plane capacitors having a common electrode constituted by a metallisation layer of the quartz crystal, the other electrodes of the capacitor being provided by several metallised strips disposed on a base member forming part of a casing containing the quartz crystal and opposite the metallisation layer of the quartz crystal, the metallised strips extending externally of the casing along tracks which are selectively connectable to earth in order to adjust the frequency of the oscillator.



4,012,701

HARTLEY OSCILLATOR

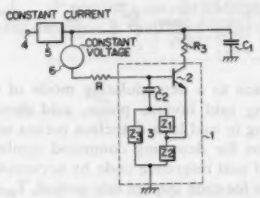
Takashi Sugimoto, and Kazumasa Noyori, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 2, 1976, Ser. No. 663,154

Claims priority, application Japan, Mar. 5, 1975, 50-26038

Int. Cl.² H03B *5/12*

U.S. Cl. 331—117 R **3 Claims**



1. A Hartley oscillator comprises:

a basic Hartley oscillation circuit including a semiconductor active element, a tank circuit coupled to the semiconductor active element and including a plurality of impedance elements and a grounded one terminal, and a coupling capacitor coupled between the control electrode of the active element and the other end of the tank circuit;

a first constant direct current source for supplying a constant current to said active element through a direct current supply terminal of said active element;

a feedback loop coupled to the output terminal of said first constant direct current source and adapted to cause a potential variation on the direct current supply terminal of said active element to be fed back to said control electrode; and

a capacitor having a grounded end and the other end coupled to the output of the first constant current source.

4,012,702

CHIME GENERATING CIRCUIT

Vernon F. Weber, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

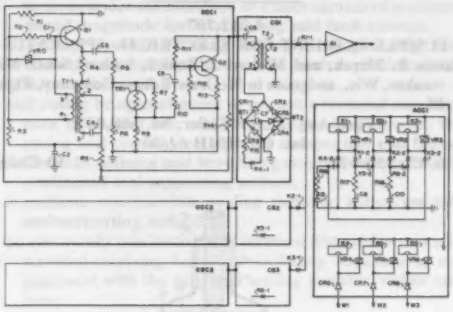
Filed Dec. 22, 1975, Ser. No. 642,968

Int. Cl.² H03B *25/00*

U.S. Cl. 331—76 **5 Claims**

1. A harmonic rich tone generating means comprising: a frequency generating means having an output and operated to produce an alternating current at said output; and a harmonic generating means, including a transformer having a primary and an output winding, a rectifier bridge circuit connected in series with said primary winding between said output and a ground potential, said bridge circuit including another recti-

fier across the D.C. terminals of said bridge and poled in a conductive direction to complete a path to said ground potential, whereby said tone of said frequency generating means is distorted and available at said transformer output winding.



4,012,703
TRANSMISSION LINE PULSE TRANSFORMERS

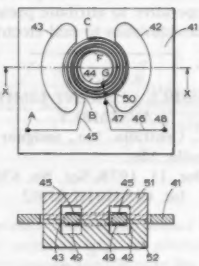
John Walter Chamberlayne, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,059

Claims priority, application United Kingdom, Nov. 29, 1974, 51763

Int. Cl.² H03H 7/00

U.S. Cl. 333—24 R **7 Claims**



1. A transmission line pulse transformer comprising a bifilar winding formed by at least two turns of each of a pair of conductors, which conductors are maintained at a fixed distance from each other throughout their length, wherein the cross-sectional area of each conductor is increased from a first value to a second value at a first point between one third and two thirds the distance around the first turn of the winding and is decreased from the second value to the first value at a second point between one third and two thirds of the distance around the last turn of the winding; said values being so chosen that the relationship between the characteristic impedance Zo of each of the pair portions having the said first value and the characteristic impedance Zl of the intervening pair portion having said second value is given by:

$$Zl \quad Zo[(1-k)/(1+k)]$$

where

$k=Cm/Ci$ Cm= the mutual capacitance between pair turns, and Ci = the self-capacitance of the pair.

4,012,704
ACTIVE AMPLITUDE EQUALIZERS

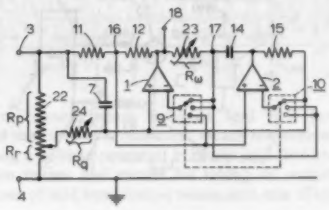
John Mortimer Rollett, London, England, assignor to The Post Office, London, England

Filed Mar. 22, 1976, Ser. No. 668,988

Claims priority, application United Kingdom, Mar. 24, 1975, 12269/75

Int. Cl.² H03H 7/16, 7/44

U.S. Cl. 333—28 R **7 Claims**

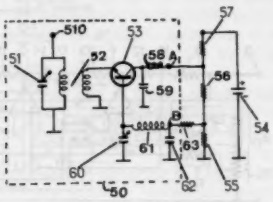


1. An active amplitude equalizer network having two differential input operational amplifiers each having a inverting input, a non-inverting input and an output, a first input terminal, a first output terminal and a reference terminal, a first, a second, a third and a fourth junction point, said first junction point being connected to said input terminal by a first resistance and being connected to said reference terminal by a second resistance, said second junction point being connected to the input terminal by a third resistance and being connected to the output of the first differential amplifier by a fourth resistance, said third junction point being connected to the output of the first differential amplifier by a first pre-determinable resistance element and being connected to the output of the second differential amplifier by a first capacitance, said fourth junction point being connected to said first junction pont by a second pre-determinable resistance element and being connected to the output of the second differential amplifier by a fifth resistance, and a second capacitance connected between the fourth junction point and the first input terminal, wherein the non-inverting input of the first differential amplifier is connected to the fourth junction point, and the non-inverting input of the second differential amplifier is connected to the second junction point, and a first pole of a first selectable switch means is connected to the inverting input of the first differential amplifier, a first pole of a second selectable switch means is connected to the inverting input of the second differential amplifier, a second and a third pole of said first selectable switch means are connected to said third junction point, a fourth pole of said first selectable switch means is connected to said second junction point, a second pole of said second selectable switch means is connected to said fourth junction point and a third and a fourth pole of said second selectable switch means are connected to said third junction point, the arrangement being that said first and said second selectable switch means are ganged to operate in synchronism the first pole of either switch being connectable at any one time to one only of the second, third and fourth poles of the same switch, the arrangement being further such that the first and second amplifier form part of a gyrator in a resonant circuit having a variable resonant frequency and which is connected to an input network consisting of said first and said second resistances said second pre-determinable resistance element and said second capacitance, the ratio of resistance of said first and said second resistance being selectable so as to control the attenuation at said resonant frequency and the Q-factor of the network, the output from said network being derived from the output of said first differential amplifier.

4,012,705
HIGH INPUT LEVEL MICROWAVE CIRCUIT

Julien Prevot, Paris Cedex, France, assignor to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Nov. 4, 1975, Ser. No. 628,845
Claims priority, application France, Nov. 29, 1974, 74.39166
Int. Cl.² H03H 7/10, 7/14; H01P 7/02, 3/08
U.S. Cl. 333—70 R 8 Claims

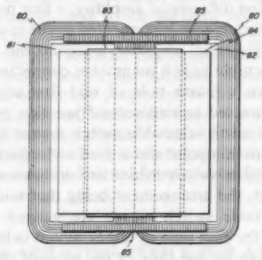


1. An active high level microwave resonant circuit with relative bandwidth smaller than 10^{-2} comprising:
- a resonant circuit tuned to the operating frequency f_o and including a capacitor and an inductor, said inductor being the secondary winding of a coupling transformer with a low coupling coefficient;
- a transistorized amplifying stage having an emitter input circuit including an inductor which is the primary winding of said coupling transformer;
- an auxiliary resonant circuit connected to the base of said transistorized stage and tuned to f_1 different from f_o;
- an output collector circuit; and
- means for biasing the electrodes of said transistorized stage; said frequency f_1 and said bias voltage values being selected so that the equivalent negative resistance R^- seen at said emitter input is a maximum at f_o.

4,012,706
SHEET-WOUND TRANSFORMER COILS

Willem F. Westendorp, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,613
Int. Cl.² H01F 15/04
U.S. Cl. 336—84 2 Claims

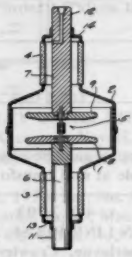


1. An electrical transformer comprising:
- at least one conductive sheet overlaid by insulation;
- a closed loop magnetic core, said conductive sheet being wound continuously in a plurality of turns about said core; and
- a plurality of axially-oriented planar strips of low magnetic reluctance electrically insulated from each other and directed from said closed loop magnetic core substantially perpendicular to the plane of said closed loop magnetic core, said strips being situated closely adjacent at least one substantially entire axial edge of said turns and carrying a large radial component of the magnetic flux leakage field established by current flow through said conductive sheet.

4,012,707
FUSIBLE ELEMENT FOR ELECTRICAL APPARATUS

James R. Marek, and Michael J. Zunick, both of South Milwaukee, Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Aug. 27, 1975, Ser. No. 608,037
Int. Cl.² H01H 61/00
U.S. Cl. 337—27 10 Claims



1. In an electrical interrupter having spaced electrodes supported by support rods and a fusible element bridging said spaced electrodes, and wherein said fusible element is subjected to elevated temperatures as a result of overload current conditions and fuses to open the circuit between said electrodes, the improvement of
- means in the area of said fusible element for controlling the transfer of heat between said fusible element and said support rods,
- said means concentrating the heat generated by current in said fusible element to a defined portion of said fusible element and operative to attribute preselected time-current fusion characteristics to said electrical interrupter.

4,012,708
OIL IMMERSIBLE CURRENT LIMITING FUSE ASSEMBLY

Melvin B. Goe, Jr., Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Dec. 11, 1975, Ser. No. 639,859
Int. Cl.² H01H 85/02
U.S. Cl. 337—205 11 Claims

1. A current limiting fuse adapted for immersion in a fluid, said fuse comprising:
- an elongate, tubular, insulative housing;

a pair of end fittings respectively attached to the opposed ends of said housing for enclosing the latter;

an elongate fusible element within said housing and adapted to sever under the influence of a fault current of predetermined magnitude for interrupting said fault current;

a unitary, insulative casing sealingly encapsulating said housing and end caps in order to render said fuse fluid-submersible,

said casing being configured to present a terminal-receiving bore in at least one end thereof extending through the casing and communicating with a respective end fitting, the walls defining said bore being configured to present a continuous seal-supporting surface;

a resilient, compressible sealing member seated on said seal-supporting surface;

an electrically conductive first terminal disposed within said terminal-receiving bore and including structure in engagement with the proximal sealing member within said bore;

means biasing said terminal in a direction for compressing the sealing member against the corresponding seal-supporting surface;

a second terminal at the remaining end of said fuse; and

means electrically connecting said first and second terminals to said fusible element in order to define a current path through said fuse.

4,012,709

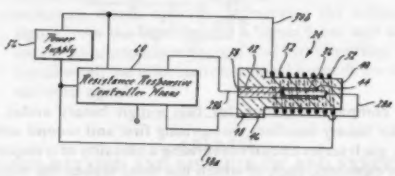
COBALT-MAGNESIUM MONOXIDE ALLOY CERAMIC PARTIAL PRESSURE OF OXYGEN SENSOR

Eleftherios M. Logothetis, Birmingham, and Kwansuh Park, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 12, 1976, Ser. No. 648,342

Int. Cl.² G01N 27/12

U.S. Cl. 338—34 **5 Claims**



1. In a partial pressure of oxygen sensor of the type having a ceramic sensor member with an electrical characteristic which varies in response to variations in the partial pressure of oxygen, a ceramic sensing member formed of an alloy of a 3d^n transition metal monoxide and an alkaline earth monoxide wherein the ceramic material satisfies the formula

$$A_{1-x}B_xO$$

where A is a 3d^n transition metal, B is an alkaline earth and x has a value less than about 0.95 and more than about 0.10.

4,012,710

MULTIPLE OUTPUT POTENTIOMETER NETWORK

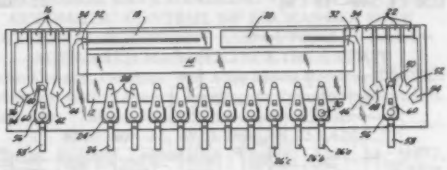
Frank L. Ward, Kensington, and Victor J. Carbonneau, Exeter, both of N.H., assignors to Clarostat Mfg. Co., Inc., Dover, N.H.

Filed May 6, 1976, Ser. No. 683,729

Int. Cl.² H01C 10/16

U.S. Cl. 338—128 **2 Claims**

1. A multiple output potentiometer network having a plurality of variable outputs including in combination a nonelectrical conducting substrate, a thin layer of high resistance material disposed upon said substrate, first and second zones of said high resistance material, a thin layer of low resistance material disposed on said first zone, a plurality of output members mounted on said substrate in spaced relation, a wiper member of each output member in contact with said high resistance material and movable thereon through a limited path, first and second termination means, first and second



trimmer resistance means between said first termination means and said second termination means respectively, means for applying a voltage potential between said first and second termination means and means for taking an output voltage between one of said termination means and one of said output members.

4,012,711

PROCESS AND APPARATUS FOR RECORDING ACOUSTICAL HOLOGRAMS

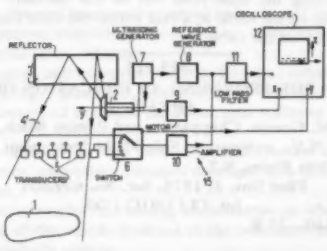
Dietlind Pekau, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 17, 1974, Ser. No. 515,532

Claims priority, application Germany, Oct. 19, 1973, 2352672

Int. Cl.² G01S 9/66

U.S. Cl. 340—1 R **9 Claims**



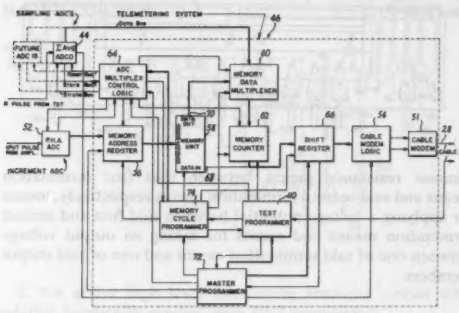
1. In an apparatus for recording acoustical holograms comprising first means for generating and transmitting ultrasonic sound and including at least one ultrasonic transmitting transducer, second means for receiving the sonic signal and transforming it into an electrical signal and including at least one sound receiving transducer, means for adding a reference signal to the electrical signal to form a combined signal and means for recording the combined signal on a recording medium as a hologram, the improvement comprising each ultrasonic transmitting transducer having a directional characteristic, means for mounting the transducer of one of said first and second means for rotation about at least one axis, a reflector surrounding the mounted transducer and having a parabolic cross section taken on a plane extending perpendicular to said one axis, and another of said first and second means having a plurality of stationary transducers.

4,012,712

SYSTEM FOR TELEMETERING WELL LOGGING DATA

William B. Nelligan, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,507
Int. Cl.² G01V 1/40
U.S. Cl. 340—18 CM 22 Claims



1. The method of transmitting well logging data uphole over a cable from a downhole tool having a digital memory unit having a multiplicity of individually addressable locations each capable of being written into and read from, comprising the steps of:

assigning a plurality of said memory locations to the digital outputs of an increment ADC;

initializing the data stored in said memory unit by writing an initializing signal into each of said assigned locations;

applying analog well logging signals to said ADC;

converting each said analog signal into a digital output corresponding to the address of an assigned memory location;

incrementing any data previously stored in said assigned memory location in response to said digital output;

reading out the data contained in the memory locations at a predetermined rate which is independent of the instantaneous rate at which said increment ADC will accept analog signals applied to it; and

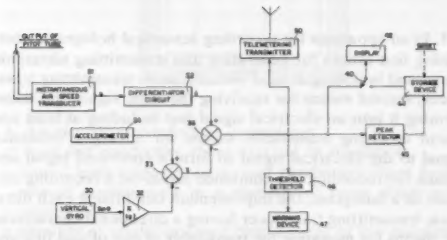
transmitting the data read out of the memory locations uphole on the cable at a rate within the data transmission capacity of the cable.

4,012,713

SYSTEM FOR PROVIDING AN INDICATION OF WIND SHEAR

Leonard M. Greene, Chappaqua, and Ramon Bloch, Yonkers, both of N.Y., assignors to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed Nov. 5, 1975, Ser. No. 629,031
Int. Cl.² G01C 5/00
U.S. Cl. 340—27 R 7 Claims



1. A system for generating a windshear signal representing the windshear condition encountered by an aircraft comprising:

means for generating a signal representing the rate of change of the instantaneous airspeed of the aircraft,

means for generating a signal representing the horizontal inertial acceleration of the aircraft,

means for subtracting the horizontal inertial acceleration signal from the rate of change of instantaneous airspeed signal to provide a windshear signal representing windshear, and

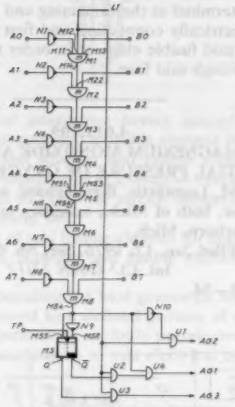
means for processing said windshear signal to provide an indication representing the magnitude thereof.

4,012,714

COMPARATOR CIRCUIT FOR TWO N-DIGIT BINARY CODES, IN PARTICULAR BINARY NUMBERS

Heinz-Jüergen Lohmann, Branschweig, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 15, 1975, Ser. No. 577,846
Claims priority, application Germany, May 27, 1974, 2425602
Int. Cl.² G06F 7/02; H03K 13/32
U.S. Cl. 340—146.2 3 Claims



1. A comparator circuit for two *n*-digit binary codes, in particular binary numbers, comprising first and second series circuits, each series circuit comprising a plurality of *n* majority decision elements, each of which has three inputs, the majority decision elements of each circuit being arranged in series with one input of each majority decision element connected to the output of the preceding majority decision element, each majority decision element, of one series, of the same place value as a majority decision element of the other series, having its respective two remaining inputs connected to respective remaining inputs of such majority decision element of the other series, one pair of connected inputs of majority decision elements of same place value being provided for the receipt of one of two binary characters or binary digits, of the same place value, to be compared, and the other pair of connected inputs thereof being provided for the receipt of the other binary characters or binary digits to be compared, and means for supplying the binary characters or binary digits of one binary code or binary number to the respective associated inputs in a negated form.

4,012,715

ADAPTIVE INFORMATION SIGNAL DISCRIMINATOR

Albert M. Essenmacher, Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.

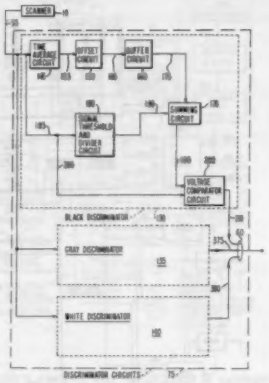
Filed Oct. 2, 1975, Ser. No. 618,799
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 AG 24 Claims

1. In a character recognition system having an OCR scanner disposed to read an encoded document and output a represen-

tative analog informational signal having noise, an improved adaptive informational signal discriminator comprising:

time response means, having a predetermined response period, for receiving the informational signal input from the scanner and time averaging the informational signal over the response period to dynamically minimize widely varying noise levels contained therein;

divider means operative to receive the informational signal from the scanner for outputting a scaled-down representation thereof;



summing means being inputted thereto by said time response means and said divider means for outputting a summed signal that dynamically minimizes widely ranging informational signal levels as well as wide ranging noise levels; and

comparator means operative to receive the informational signal from the scanner and a signal from said summing means for comparison thereof and for outputting a digital signal when the informational signal exceeds the dynamic summed signal.

4,012,716

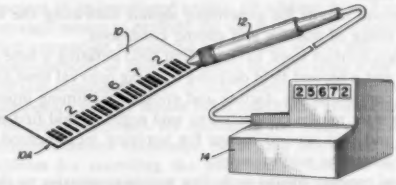
CODED RECORD AND METHOD OF AND SYSTEM FOR INTERPRETING THE RECORD

Carlos B. Herrin, Bellbrook, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 16, 1971, Ser. No. 199,231

Int. Cl.² G06K 9/18

U.S. Cl. 340—146.3 Z **20 Claims**



1. A coded record adapted for machine reading comprising a record member,

and a series of areas of different first and second characteristics on said record member, the areas of first and second characteristics being alternated with each other in said series, the relative dimensions of pairs of areas of the first characteristic and the relative dimensions of pairs of areas of the second characteristic providing coded representations of bit values, wherein the coded representations of bit values are provided by consecutive pairs of areas of the first characteristic and consecutive pairs of areas of the second characteristic.

4,012,717

BI-PROCESSOR DATA HANDLING SYSTEM INCLUDING AUTOMATIC CONTROL OF EXCHANGES WITH EXTERNAL EQUIPMENT AND AUTOMATICALLY ACTIVATED MAINTENANCE OPERATION

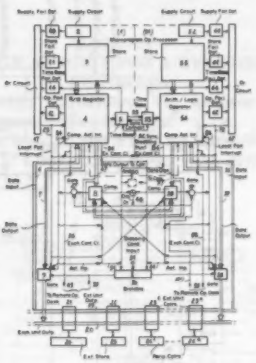
Lucien Censier, Conflans, and Alice Maria Recoque, Chatenet Malabry, both of France, assignors to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Apr. 23, 1973, Ser. No. 353,424

Claims priority, application France, Apr. 24, 1972, 72.14418

Int. Cl.² G06F 11/00, 15/16, 15/46

U.S. Cl. 340—172.5 **7 Claims**



3. A data processing system comprising a central unit, a plurality of external store and peripheral units, a common inputting channel from said external units to said central unit and a common outputting channel from said central unit to said external units, wherein:

said central unit comprises first and second simultaneously operating, time-base synchronized microprogrammed processors of identical hardware and software organizations,

each processor having a data output connection to the said common outputting channel through data transfer gate means,

each processor further having a bus output on which all the codes of the words involved in the execution of any task successively appear,

each processor further having a first task interrupt input the activation of which initiates a checkup routine in the processor, and first and second checkup result responsive outputs, one of which is activated for a positive result of the checkup and the other of which is activated for a negative result of the checkup,

a two-condition member having distinct actuation inputs and a pair of complementary condition outputs respectively controlling in reciprocal transfer conditions the data transfer gate means of said first and second processors, one of the said actuation inputs being connected to the first checkup responsive output of the first processor and to the second checkup responsive output of the second processor and the other one of the said actuation inputs being connected to the second checkup responsive output of the first processor and to the first checkup responsive output of the second processor, and,

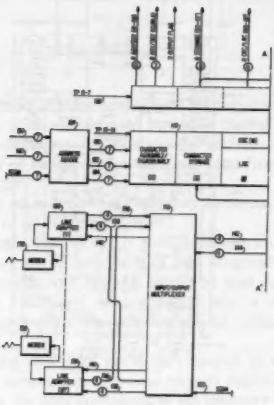
code comparator means having respective inputs connected to the bus outputs of the first and second processors and a mismatch output connected to both the said first task interrupt inputs of the processors, to inhibiting inputs of both the said data transfer gates and to a code comparator means self-inhibiting input.

4,012,718

COMMUNICATION MULTIPLEXER MODULE

Clarence R. Young, Hunter; Wendell A. Law, Kaysville; William G. Barrett, Bountiful; Norman F. Priebe, and Harry D. Wise, both of Salt Lake City, all of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,472
Int. Cl.² G06F *3/00*
U.S. Cl. 340—172.5 **13 Claims**



1. In a communications multiplexer module for transferring data between a host computer and a plurality of line adapters, the combination comprising:

an addressable memory for storing a plurality of control words, there being one control word associated with each of said line adapters and addressable therewith,

each said control word including control character table selection bits, control interpretation table selection bits, and an area for temporarily storing a character being transferred between said host computer and the associated line adapter;

data transfer means connecting said addressable memory to said line adapters and said host computer for the transfer of data between the temporary storage area of an addressed control word and its associated line adapter or said host computer;

a first memory comprising a plurality of addressable control character tables,

a second memory comprising a plurality of addressable control interpretation tables;

means for applying said control character table selection bits to said first memory to select one of said control character tables;

means for applying each character temporarily stored in a control word to said first memory as an address;

means for applying said control interpretation table selection bits to said second memory to select one of said control interpretation tables;

means for applying the output from said first memory to said second memory as an address;

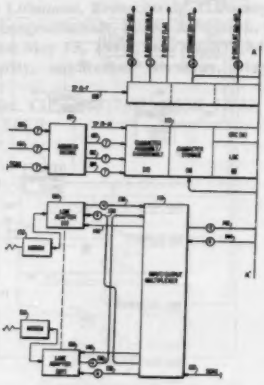
and means connected to said addressable memory for addressing said control words and their associated line adapters in a predetermined sequence.

4,012,719

COMMUNICATION MULTIPLEXER MODULE

Wendell A. Law, Kaysville; William G. Barrett, Bountiful; Norman F. Priebe, and Harry D. Wise, both of Salt Lake City, all of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,479
Int. Cl.² G06F *3/00*
U.S. Cl. 340—172.5 **10 Claims**



1. In a communications multiplexer module for transferring digital data between a data processor and a plurality of line adapters, said multiplexer module including an addressable memory having a plurality of storage locations for storing a plurality of control words, one control word being associated with each line adapter, a register connected to said memory for receiving and storing one control word at a time, time shared logic circuit means responsive to said register for modifying control words received therefrom and applying them to said memory, and means for addressing said memory to sequence said control words one at a time in a predetermined sequence into said register and back into their storage locations through said time shared logic circuit means, the improvement comprising:

first means for generating signals representing increments of time;

second means for generating signals indicating the occurrence of starting and ending conditions;

each control word having a first field defining a time count and a second field defining a timing interval limit and the conditions for starting and ending said timing interval;

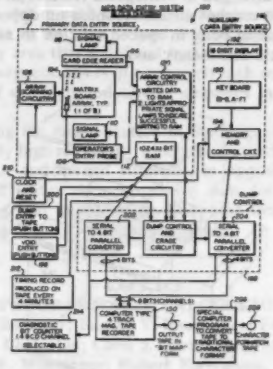
counter means connected to said register, said first means, and said second means for applying incremented timer counts to said memory;

said counter means including means responsive to the first and second fields of a given control word in said register for applying an incremented timer count to the first field of a control word location in said memory if said first means is generating a signal and said second means has produced a signal indicating the occurrence of a starting condition corresponding to the starting condition defined by said second field but has not produced a signal indicating the occurrence of an ending condition corresponding to the ending condition defined by said second field.

4,012,720
DATA ENTRY SYSTEM

James Call, 304 Fenimore Road, Mamaroneck, N.Y. 10543, and John Robertson, 174 Caldwell St., Chillicothe, Ohio 45601

Filed Sept. 25, 1975, Ser. No. 616,842
Int. Cl.² G06F 3/00
U.S. Cl. 340—172.5 9 Claims

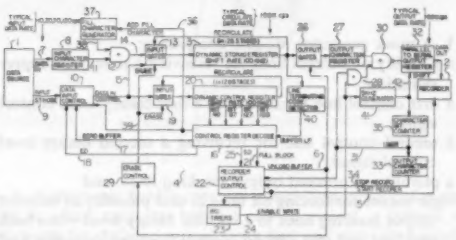


1. A data entry system for providing a computer readable record of information relating to at least one common subject having a plurality of different possible general categories of attributes, at least two of said different general categories of attributes each comprising a plurality of different selectable specific attributes, said system comprising at least one electrical crosspoint matrix array of a plurality of open circuit electrical contact crosspoints, each of said crosspoints having indicia means adjacent thereto corresponding to and identifying one of said selectable specific attributes for one of said possible general categories of attributes and having an open circuit state corresponding to one value of a digital data bit corresponding to the absence of said associated specific attribute of said general category of attributes associated with that crosspoint and a closed circuit state corresponding to a different value of said digital data bit corresponding to the presence of said associated specific attribute of said general attribute category associated with that crosspoint; electrical contact probe means for selectively changing the value of said bit associated with one of said crosspoints by selectively contacting said one crosspoint; addressable temporary storage means having a plurality of different bit addresses; means for synchronously scanning said temporary storage means and said crosspoint matrix array for selectively connecting each of said crosspoints to an associated unique bit address in said temporary storage means to provide the value of said synchronously scanned crosspoint associated bit thereto at the time of said synchronous scan of said crosspoint for providing a bit value map of said crosspoint array in said temporary storage means, said temporary storage means being selectively connectable to each of said crosspoints for recording the state of said synchronously scanned associated bit at said associated unique bit address for recording the presence or absence of said associated specific attribute of said general category of attributes associated with said synchronously scanned crosspoint; magnetic storage means for permanently storing at least said crosspoint array bit value map, said permanently stored crosspoint array bit value map being computer readable for providing said computer readable information record; and means operatively connected between said temporary storage means and said permanent storage means for selectively dumping at least said temporarily stored crosspoint array bit value map to said permanent magnetic storage means for permanent storage thereof, said selective dumping means comprising means for erasing said temporary storage means when said temporarily stored crosspoint array bit value map is selectively dumped to said permanent magnetic storage means; said probe means comprising signalling means for providing an indication to an operator thereof that said data bit associated with the crosspoint being contacted by said probe means at a particular time has been loaded into said temporary storage means, said signalling means being enabled to provide said indication when said probe means contacted crosspoint is synchronously scanned to selectively connect said synchronously scanned crosspoint to the unique bit address in said temporary storage means associated therewith.

4,012,721
DIGITAL LOGIC CIRCUIT FOR A DYNAMIC BUFFER REGISTER

Donald S. Lindsay, Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Filed May 23, 1975, Ser. No. 580,450
Int. Cl.² G06F 13/02; G11C 9/00, 21/00
U.S. Cl. 340—172.5 10 Claims



1. In combination a source of coded pulse groups available at a first maximum rate wherein each of said groups represent a character, a circulating storage register,

means for storing a plurality of coded pulse groups in said register comprising means for applying said coded pulse groups from said source to said register at a first rate and for circulating such groups in said register at a second rate,

a recorder,

means for applying groups stored in said register to said recorder for recording such last named applied groups at a third rate in blocks wherein each of said blocks comprises 88 groups each, said third rate being greater than said first rate but less than said second rate,

means responsive to the presence of each block of groups stored in said register for initiating a recording sequence comprising means for starting said recorder to record the groups contained in said one block, said recorder requiring a predetermined start-up period,

means for delaying the application of groups corresponding to said one block from said register to said recorder for recording until the elapse of said start-up time period,

means for enabling said first mentioned means to continue to apply groups in addition to those contained in one block to said register during said recorder start-up period and during the recording of said one block comprising the capacity of said register being of the order of 128 groups,

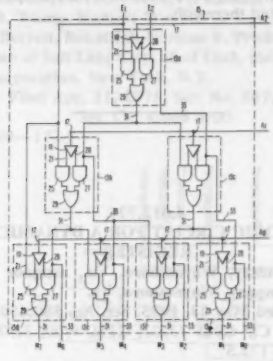
and means responsive to each block of groups applied to said recorder for halting the application of further groups to said recorder from said register and for stopping said recorder from recording.

4,012,722

HIGH SPEED MODULAR MASK GENERATOR

Daniel Danko Gajski, Philadelphia, and Bhalchandra Ramchandra Tulpule, Frazer, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 20, 1975, Ser. No. 618,269
Int. Cl.² G06F 7/00
U.S. Cl. 340—172.5 8 Claims



1. A mask generator module comprising:

a plurality of address lines for receiving a numerical representation;

a first control line for receiving a first binary level control signal;

a second control line for receiving a second binary level control signal;

a plurality of ordered output masking lines; and

logic means for forcing all lines in said plurality of ordered output masking lines to a specific binary level when both said first and said second control lines are receiving said specific binary level and for conveying a particular binary level on solely a contiguous set of output masking lines starting with the first output line in said plurality of ordered output masking lines when said first and second control lines are receiving complementary binary levels and said plurality of address lines is receiving a numerical representation, said contiguous set being in number equal to said numerical representation being received on said plurality of address lines.

4,012,723

MAGNETIC BUBBLE MEMORY PACKAGING ARRANGEMENT AND ITS METHOD OF FABRICATION

James G. Harper, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1975, Ser. No. 581,605
Int. Cl.² G11C 19/08
U.S. Cl. 340—174 TF 24 Claims

1. A package assembly for a magnetic bubble domain chip, said package assembly comprising:

a. a metal lead frame having a plurality of selectively positioned electrical conductors and a chip receiving region adjacent to corresponding ends of said plurality of electrical conductors;

b. a magnetic bubble domain chip mounted on said chip receiving region of said metal lead frame and having a plurality of magnetic bubble domain functions associated therewith;

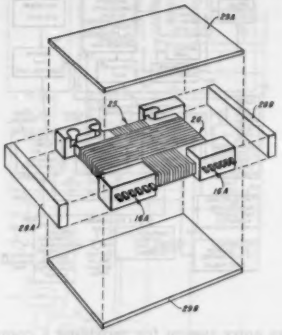
c. a plurality of electrical contacts on said ship for said magnetic bubble domain functions to enable selective actuation thereof;

d. means electrically interconnecting at least some of said electrical contacts on said chip with respective electrical conductors of said lead frame;

e. a body of insulating material encapsulating said chip and said lead frame, the other ends of said electrical conductors extending outwardly of said insulating body and terminating in connector pins;

f. means for providing a selectively energizable in-plane magnetic field for said chip including first and second field coil means respectively encircling said insulating body and arranged in orthogonal relation to each other;

g. permanent magnet means mounted on opposite ends of said insulating body in spaced relation to said first and second field coil means; and



h. magnetic field spreader members of magnetic material mounted on opposite major surfaces of said insulating body in spaced relation to said first and second field coil means, said magnetic field spreader members respectively engaging said permanent magnet means and defining therewith a magnetic enclosure for said encapsulated magnetic bubble domain chip; wherein

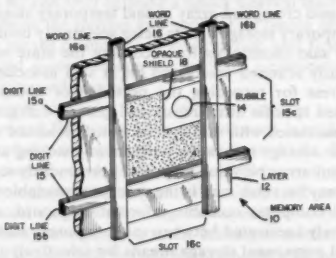
i. said body of insulating material has enlarged spacer portions extending beyond the dimensions of said first and second field coil means with said permanent magnet means and said magnetic field spreader members abutting said enlarged spacer portions of said insulating body in respective spaced relation to said first and second field coil means.

4,012,724

METHOD OF IMPROVING THE OPERATION OF A SINGLE WALL DOMAIN MEMORY SYSTEM

Marlin Marshall Hanson; Ernest James Torok, and Roger Edward Lund, all of St. Paul, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,178
Int. Cl.² G11C 11/14
U.S. Cl. 340—174 TF 4 Claims



1. In a bubble memory system including a planar layer of a

magnetizable material in which single wall domains or bubbles may be sustained and moved between first, second, third and fourth stable positions in a memory area in said layer, which stable positions are associated with intersecting first and second inductively coupled striplines, by drive current signals that are coupled to said layer by said striplines, the method of preventing said bubbles from escaping from the magnetomotive effect of said drive current signals to transfer said bubbles between said first, second, third and fourth stable positions or from sticking in either said first, second, third or fourth stable positions, comprising:

forming a slot in each of said first and second intersecting striplines in the area of said intersection for forming a memory area that is defined by said intersecting slots;

forming magnetic layers of a relatively high retentivity upon each of said first and second striplines in said memory area;

establishing the magnetization in the magnetic layers of a relatively high retentivity which are formed upon each of said first and second striplines, in opposing directions oriented across their respective slots for magnetically repelling said bubble away from said first and second striplines and into said memory area.

4,012,725

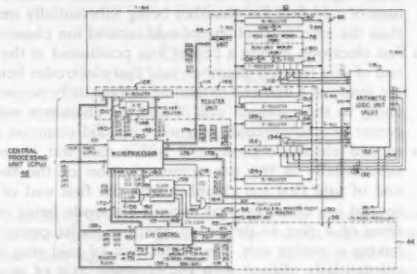
PROGRAMMABLE CALCULATOR

Richard M. Spangler; Eugene V. Burmeister; Frank E. Cada; Wayne F. Covington; Chris J. Christopher; Myles A. Judd; Freddie W. Wenninger; Robert E. Watson, and Kent W. Simcoe, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 269,899, July 7, 1972, abandoned. This application May 30, 1974, Ser. No. 469,727

Int. Cl.² G06F *15/40, 15/02, 3/14, 7/38*

U.S. Cl. 340—172.5 **41 Claims**



1. Electronic data processing apparatus comprising:

keyboard input means for entering lines of one or more alphameric characters each into said electronic data processing apparatus;

first memory means for storing lines of one or more alphameric characters each;

second memory means, coupled to said keyboard input means and first memory means, for temporarily storing each line of one or more alphameric characters being entered into said electronic data processing apparatus from said keyboard input means or recalled from said first memory means;

said keyboard input means including store control means for causing a line of one or more alphameric characters then stored in said second memory means to be stored in said first memory means and including recall control means for causing a designated line of one or more alphameric characters stored in said first memory means to be recalled to said second memory means;

first logic means, coupled to said keyboard input means, first memory means, and second memory means, for transferring a line of one or more alphameric characters then stored in said second memory means to said first memory means in response to actuation of said store control means and for transferring a designated line of one or more alphameric characters from said first memory means to said second memory means in response to actuation of said recall control means;

display means, coupled to said second memory means, for visually displaying a line of one or more alphameric characters then stored in said second memory means;

said display means including means for visually displaying a cursor for designating any character position of the displayed line of one or more alphameric characters;

said keyboard input means including cursor control means for controlling the position of said cursor; and

second logic means, coupled to said keyboard input means, second memory means, and display means, for positioning said cursor to designate any character position of the displayed line of one or more alphameric characters in response to actuation of said cursor control means.

4,012,726

MAGNETIC BUBBLE REPLICATOR

Peter Istvan Bonyhard, Edison, and James Lanson Smith, Bedminster, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1975, Ser. No. 643,679

Int. Cl.² G11C *11/14, 19/08*

U.S. Cl. 340—174 TF **11 Claims**

1. A magnetic bubble memory comprising a layer of material in which magnetic bubbles can be moved, a pattern of elements for defining in said layer first and second channels along which bubbles move in response to a magnetic field reorienting in the plane of said layer, said first path including a turn element and having a long axis, an electrical conductor coupling said turn element at an angle with respect to said axis, said element having a geometry to provide an elongated flux path when said field is aligned at said angle.

4,012,727

ALARM CONTROL SYSTEM

Benedetto Grossi, Stanford, and Ignas Budrys, Bethel, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed May 21, 1975, Ser. No. 579,335

Int. Cl.² G08B *25/00*

U.S. Cl. 340—213 R **14 Claims**

1. An alarm control system, comprising

a control panel;

at least one alarm responding circuit having connected therein a plurality of alarm responding or initiating stations remotely located from said control panel for responding to an alarm condition;

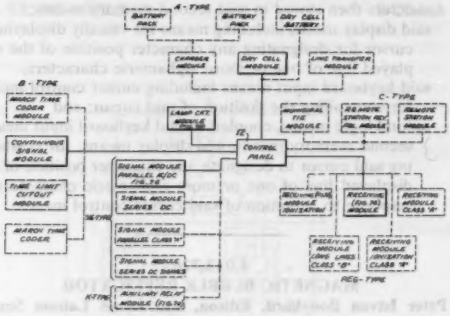
at least one alarm indicating circuit having connected therein a plurality of alarm indicating stations remotely located from said control panel;

a common control circuit strip mounted on said control panel and having a plurality of kinds of common control circuit modules, including signal current and power supply control circuits, adapted to be connected to said common control circuit strip;

a functional circuit strip mounted on said control panel, and

a plurality of kinds of functional circuit modules including at least receiving and signalling modules;

means for receiving said receiving and signalling modules in discrete connector areas on said functional circuit strip, including means for connecting terminals in common between all said connector areas and means for interconnecting said receiving and signalling modules through said strip selectively to each other and to said alarm initiating circuit and to said alarm indicating circuit respectively such that a receiving module can be substituted for a signalling module in a same given discrete connector area on said functional circuit strip.

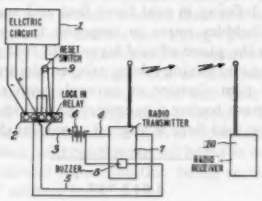


4,012,728

BACK UP ALARM SYSTEM

Eugene W. Fowler, Venice, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 31, 1975, Ser. No. 563,631
Int. Cl.² B60R 25/10
U.S. Cl. 340—224 **3 Claims**



1. A back up alarm system for a burglar alarm system utilizing an electric circuit having electrical conductors for operating a burglar alarm under predetermined circumstances, said back up alarm system comprising

relay means electrically connected to the electric circuit of a burglar alarm system having electrical conductors;

a source of electrical energy;

a radio transmitter for transmitting radio signals; and

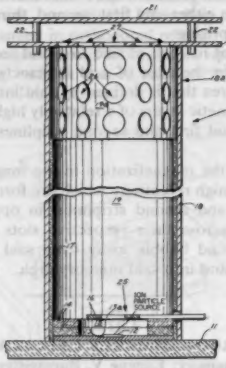
electrically conductive leads electrically connecting the relay means, the source of electrical energy and the raido transmitter in a back up circuit with the burglar alarm circuit in a manner whereby the relay means is energized by the electric circuit of the burglar alarm system and maintains the relay means normally open as long as the burglar alarm system is in operative condition and when an electrical conductor of the burglar alarm circuit is cut the relay means is deenergized and closes the back up circuit to actuate the transmitter to transmit radio signals indicating that an electrical conductor of the burglar alarm circuit has been cut, said burglar alarm circuit and said back up circuit constituting different circuits.

4,012,729

MULTI-ELEMENT IONIZATION CHAMBER

Stephen Weaver, Lakewood; Lyman L. Blackwell, Boulder, and Paul A. Staby, Denver, all of Colo., assignors to Statitrol Corporation, Lakewood, Colo.

Filed June 19, 1975, Ser. No. 588,153
Int. Cl.² G08B 17/10
U.S. Cl. 340—237 S **16 Claims**



1. An aerosol detection device, comprising:

structure defining intercommunicating first and second substantially cylindrical ion chambers, each of said chambers having a longitudinal axis and first and second ends, the second end of said first ion chamber being in communication with the first end of said second ion chamber and the longitudinal axis of said ion chambers being substantially aligned to define a common axis, the effective volume of said first ion chamber being substantially smaller than the effective volume of said second ion chamber;

a first electrode having a center axis positioned at the first end of said first ion chamber, said first electrodes being in the shape of a disc and extending substantially perpendicularly to the common axis of said ion chambers with its center axis substantially aligned with said common axis;

a second electrode positioned within said ion chambers substantially at the intercommunication of the second end of said first ion chamber with the first end of said second ion chamber; said second electrode being in the form of a ring to define an aperture in its center and having a center axis, the center axis of said ring being substantially aligned with the common axis of said ion chambers;

a third electrode positioned at the second end of said second ion chamber;

particle source means for substantially simultaneously emitting charged particles into said first and second ion chambers, said particle source means being a single source and having an axis of radiation along which emitted charged particles are radiated, said single particle source being in said first ion chamber adjacent said first electrode with its axis of radiation substantially aligned with the common axis of said ion chambers whereby to introduce charged particles into said first ion chamber and therethrough through the aperture defined by said second electrode into said second ion chamber;

means for establishing a single ion current flow of said charged particles third electrodes serially through said ion chambers, said means being operable to establish under clear air conditions a first voltage gradient in said first ion chamber between said first and second electrodes and a second voltage gradient in said second ion chamber between said second and third electrodes, said first voltage gradient being substantially higher than said second voltage gradient to render the electrical resistance characteristic of said first ion chamber to said ion current flow

therethrough relative to said second ion chamber substantially insensitive to the presence or absence of smoke aerosols and the like; and

means for connecting said second ion chamber in communication with atmosphere to be monitored so that smoke aerosols and the like therein enter said second ion chamber, the electrical resistance characteristic, of said second ion chamber to said ion current flow, increasing as the result of the entry of smoke aerosols and the like therein whereby to cause a change in the voltage on said second electrodes indicative of the presence of smoke aerosols and the like in the atmosphere being monitored.

4,012,730

DOPPLER DETECTION DEVICE WITH INTEGRATOR SAMPLING MEANS TO INHIBIT FALSE ALARMS

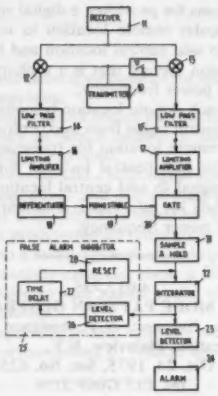
David Nicholls, 56 Glen Road, Glen Waverley, Victoria, Australia

Filed Mar. 25, 1975, Ser. No. 561,890

Claims priority, application Australia, Mar. 25, 1974, 7032/74

Int. Cl.² G08B *13/18*

U.S. Cl. 340—258 A **7 Claims**



1. A security device comprising a Doppler principle detection device, means for generating an output signal from a Doppler shift signal developed by the detection device, an integrator for integrating the output signal, an alarm adapted to be activated when the output of the integrator reaches a predetermined threshold level, and a false alarm inhibitor including means for sampling the integrator output and for resetting the integrator if the integrator output does not reach said predetermined threshold level within a predetermined time, said inhibitor acting after said integrator output has reached a predetermined signal level which is lower than said predetermined threshold level.

4,012,731

BURGLAR ALARM SYSTEM

Anna Grace Solomon, 3611 Kalsman Drive, Los Angeles, Calif. 90016

Filed Jan. 5, 1976, Ser. No. 646,831

Int. Cl.² G08B *13/08*

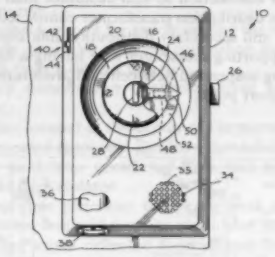
U.S. Cl. 340—274 R **8 Claims**

1. An improved burglar alarm system for mounting about the rotatable shaft of a doorknob attached to a door, said system comprising in combination:

a housing for mounting to the door over the doorknob with the shaft extending outwardly from the housing through an opening in the housing;

an electrical circuit disposed in said housing and including an annunciator, a power source, a power switch and a normally closed magnet-responsive switch connected in series circuit, the magnet-responsive switch being operative, when activated by a magnet, to open said circuit;

means for mounting the magnet-responsive switch in a predetermined position in the housing for activation by an associated magnet; and



a magnet for mounting on said shaft for rotation therewith opposite and closely adjacent said predetermined position to open the normally closed magnet-responsive switch only when said shaft is in a resting unrotated position and to free the magnet-responsive switch to close the circuit when the doorknob and shaft are rotated in either direction out of the resting position.

4,012,732

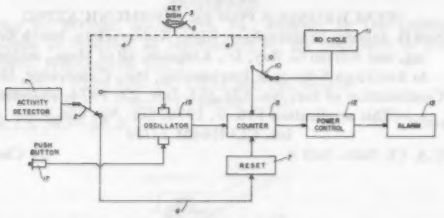
SECURITY DEVICE

Kennan C. Herrick, 2160 Mastlands Drive, Oakland, Calif. 94611

Filed Mar. 19, 1976, Ser. No. 668,604

Int. Cl.² G08B *21/00, 13/00*

U.S. Cl. 340—279 **8 Claims**



1. A security device comprising:

a. an alarm,

b. a clock adapted to actuate said alarm when a predetermined time period has elapsed,

c. a human physical activity sensor adapted to reset said clock to the beginning of said predetermined time period when human activity is sensed, and

d. means for sensing an inanimate object in contact therewith, said means adapted in the absence of said inanimate object to prevent actuation of said alarm when said predetermined time period has elapsed.

4,012,733

DISTRIBUTION POWER LINE COMMUNICATION SYSTEM INCLUDING A MESSENGER WIRE COMMUNICATIONS LINK

Ian A. Whyte, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 16, 1975, Ser. No. 622,915

Int. Cl.² H04M *11/04*

U.S. Cl. 340—310 A **1 Claim**

1. A distribution power line carrier communication system

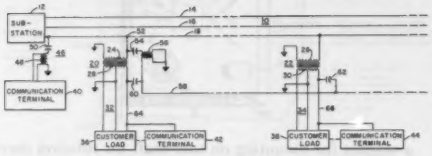
transmitting carrier signals to electrical customer load locations served by a distribution power line system carried on support poles, said communication system comprising:

a primary line conductor of said distribution system transmitting said carried signals and carried by said support poles;

a plurality of secondary line conductors of said distribution system carried by predetermined ones of said support poles for connection to said customer load locations;

at least one distribution transformer connected between the primary and secondary distribution line conductors;

a cable supporting messenger wire having a high resistance and being suspended between said predetermined ones of said support poles;



frequency responsive impedance means connected between said messenger wire and ground potential, said impedance means having a high impedance at the carrier signal frequencies and a low impedance at the power line frequency;

first signal coupling circuit means connected between said primary line conductor and said messenger wire for transmitting carrier signals therebetween and around said one distribution transformer; and

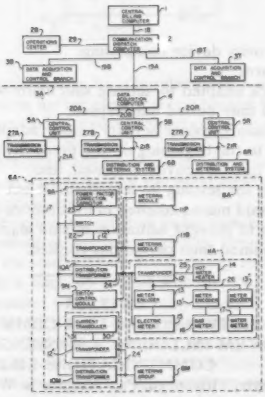
second signal coupling circuit means connected between said messenger wire and said plurality of secondary line conductors for transmission of said carrier signals between said messenger wire and said customer load locations.

4,012,734

SYNCHRONOUS POWER COMMUNICATING

Neil H. Jagoda, Framingham; Klaus Kubierschky, North Reading, and Adrian G. Roy, Jr., Kingston, all of Mass., assignors to American Science & Engineering, Inc., Cambridge, Mass.

Continuation of Ser. No. 535,352, Dec. 23, 1974, abandoned.
This application Feb. 9, 1976, Ser. No. 656,521
Int. Cl.² H04M *11/04*
U.S. Cl. 340—310 A **21 Claims**



1. Synchronous power communicating apparatus for communication between a central station and remote stations over power lines that may also carry electrical power at power frequency comprising,

a source of a carrier signal of frequency that is a harmonic of half said power frequency at said central and remote stations in the frequency range between 500 and 30 kHz for carrying digital data,

a source of a digital data signal at said central and remote stations,

means for establishing synchronism between each digital data signal and the electrical power frequency carried by said power lines,

means for modulating a carrier signal with each digital data signal,

means for coupling the modulated carrier signal to said power lines to transmit the modulated carrier signal over the power lines to a receiving means at each location including demodulating means for demodulating the modulated carrier signal to recover the digital data signal carried by the modulated carrier,

means at each location coupling the modulated carrier signal from the power lines to said demodulating means,

means for synchronizing the demodulating means with the electrical power carried by said power lines for demodulating the modulated carrier signal received at the receiving station to recover the digital data carried by the modulated carrier signal,

the source of a digital data signal at said central location including means for providing a digital signal designating both a particular remote location to transmit a digital data signal to said central location and the data bit rate for transmission thereof that is a subharmonic of or the same as said power frequency,

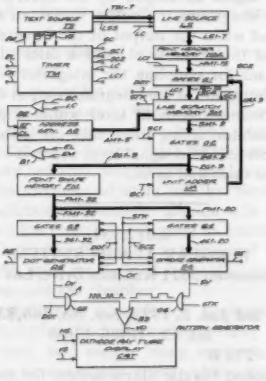
and means at each remote location responsive to reception of a digital control signal from said central location designating that remote location for transmission of a digital data signal to said central location for transmitting a digital data signal to said central location at the control designated data bit rate that is a subharmonic of or the same as said power frequency.

4,012,735

DUAL MODE PATTERN GENERATOR

James M. Keane, Neconset, N.Y., assignor to Systems Resources Corporation, Plainview, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,648
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 AD **2 Claims**



1. In a display system, the method of representing the characters of a font by representing some of the characters of the font by matrix arrays of dots wherein each row of the matrix is stored as a combination of bits in one-to-one correspondence with the presence of dots in the row of the matrix and

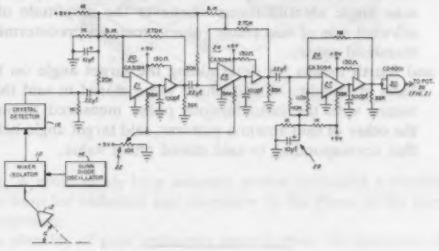
representing other characters of the font by sets of strokes disposed on a group of parallel lines wherein the length of each stroke is stored as a number in the form of a coded combination of bits.

4,012,736

RADAR SPEEDOMETER

James H. Angwin, Merrimack, N.H., assignor to Merlin A. Pierson, Newton, Mass.

Filed Dec. 11, 1974, Ser. No. 531,807
Int. Cl.² G01S 9/44
U.S. Cl. 343—8 **14 Claims**



1. An electronic radar speedometer for measuring the speed of a vehicle comprising;

means including antenna means for providing a cyclic signal the frequency of which relates to the velocity of the vehicle relative to ground,

means responsive to said cyclic signal for sensing the duty cycle of said signal and for passing said cyclic signal substantially only when said signal has a duty cycle which lies within a predetermined range from a first preselected duty cycle to a second preselected duty cycle, said range being substantially centered about a 50% duty cycle,

means responsive to said passed cyclic signal for counting the cycles thereof,

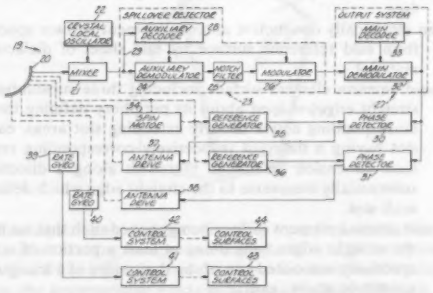
and means responsive to said counting means for providing a reading corresponding to vehicle speed.

4,012,737

PSEUDONOISE GUIDANCE SYSTEM WITH SPILLOVER REJECTION

Richard Roland Waer, and Ernest Isaac Rensin, both of Northridge, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 670,730, Sept. 26, 1967, abandoned. This application Oct. 19, 1970, Ser. No. 81,815
Int. Cl.² G01S 9/02
U.S. Cl. 343—17.5 **19 Claims**



1. In a continuous wave pseudonoise guidance system having a transmitter source of an alternating signal, a transmitter modulator connected from said source to a transmitting antenna, and a transmitter code generator to operate said transmitter modulator in a manner to code said signal, a receiver comprising:

a receiving antenna;

a main demodulator;

a main code generator to operate said main demodulator in a manner to reconstruct an alternating signal from a reflected wave corresponding to the output of said transmitter source;

a main feedback circuit for synchronizing the output of said main code generator with the code of an incoming wave reflected from a distant target;

an auxiliary demodulator connected from said receiving antenna;

a notch filter located at the center of the transmission band and connected from said auxiliary demodulator;

a receiver modulator connected from said notch filter to said main demodulator;

an auxiliary code generator to operate both said auxiliary demodulator and said receiver modulator in a manner to pass coded waves reflected from distant targets to said main demodulator without considerable distortion while reconstructing coded spillover waves received directly from said transmitter or by reflection from objects near to said transmitter or receiver, said notch filter heavily attenuating reconstructed spillover waves while passing unreconstructed waves reflected from distant targets without considerable attenuation; and

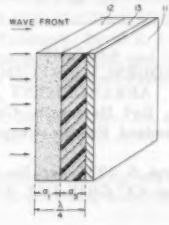
an auxiliary feedback circuit to synchronize the output of said auxiliary code generator with the code of a spillover wave, said auxiliary feedback circuit being substantially insensitive to the code of a wave reflected from a distant target due to the low signal strength thereof, all of said code generators being constructed to produce the same code, but shifted in phase.

4,012,738

COMBINED LAYERS IN A MICROWAVE RADIATION ABSORBER

Rufus W. Wright, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1961, Ser. No. 86,256
Int. Cl.² H01Q 17/00
U.S. Cl. 343—18 A **18 Claims**



1. Combined layers in a microwave radiation absorber comprising a layer of dielectric material of relatively high dielectric constant and a layer of magnetic material having a relatively high coefficient of magnetic permeability, said layers of dielectric material and magnetic material being in substantially parallel arrangement to one another and adapted to be positioned in a high electric field region and in a high magnetic field region of a radiation reflecting surface, respectively, said layer of magnetic material being adapted to be positioned in said high magnetic field region between said layer of dielectric material and said reflecting surface, said layer of dielectric material having a front surface with respect to the wave front of incident radiation, said front surface being

at a distance from said reflecting surface approximately an odd multiple of a quarter wavelength of microwave radiation as measured within said combined layers.

4,012,739

INSTRUMENT LANDING SYSTEM (ILS) WITH SIMPLIFIED TRANSMITTER

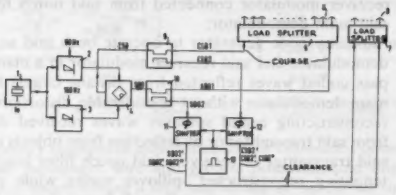
Günter Höfgen, and Werner Poschadel, both of Kornwestheim, Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 19, 1976, Ser. No. 659,409

Claims priority, application Germany, Apr. 27, 1975, 2508539

Int. Cl.² G01S *1/16, 1/18;* H02M *5/16*

U.S. Cl. 343—108 R **6 Claims**



1. In an instrument landing system, the combination comprising:

means including a transmitter and modulation means for generating two initial pairs of signals, each of said initial pairs including a first signal having an RF carrier with sidebands of first and second modulation tones and a second signal comprising only said sidebands;

phase modulation means responsive to the signals of one of said initial pairs for generating a third pair comprising carrier with sidebands and sidebands only at a predetermined frequency offset by applying a continuous phase shift at a predetermined rate of phase change to the signals of one of said initial pairs;

and means separately responsive to said third pair and the other of said initial pairs to separately combine and radiate the two signals of said other initial pair to form a first transmittable signal corresponding to a course signal pattern and to combine and radiate the signals of said third pair to form a second transmittable signal corresponding to a clearance signal pattern.

4,012,740

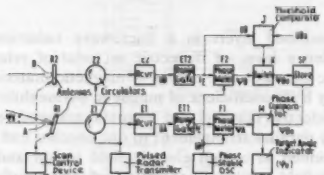
RADIO-FREQUENCY DIRECTION-FINDING ARRANGEMENT

Wilhelm Lenneper, Bad Herrenalb, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,650

Int. Cl.² G01S *3/58, 9/22*

U.S. Cl. 343—118 **9 Claims**



1. A scanning direction-finding system for reducing the effect of multipath reception on the accuracy of angular determinations, said system having means for developing at least first and second antenna patterns, through each of which, radio frequency energy emanating from a target is separately received, said first antenna pattern including a null along its axis of angular symmetry and said second antenna pattern having a maximum along its axis of angular symmetry, comprising:

first means for displacing the effective symmetry axes of said patterns by a predetermined angle with respect to each other;

second means for continuously and separately measuring the phase of energy received through each of said first and second patterns;

third means for storing the phase value measured through one of said antenna patterns along with corresponding scan angle identifications whenever the amplitude of a selected one of said phase values crosses a predetermind threshold value;

and fourth means for determining the target angle on the basis of equality of said phase value stored in said third means with the instantaneous phase measured through the other of said antenna patterns, said target angle being that corresponding to said stored phase value.

4,012,741

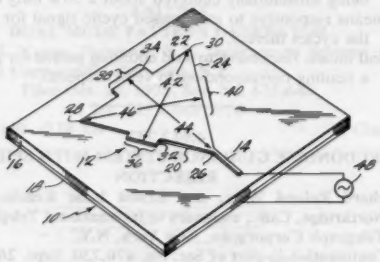
MICROSTRIP ANTENNA STRUCTURE

Russell W. Johnson, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Oct. 7, 1975, Ser. No. 620,272

Int. Cl.² H01Q *1/38*

U.S. Cl. 343—700 MS **16 Claims**



1. A radio frequency antenna structure comprising:

an electrically conductive reference surface,

a sheet of dielectric material overlying said reference surface,

an electrically conductive antenna element surface spaced from said reference surface by said sheet of dielectric material,

said antenna element surface including three substantially straight edges shaped about its periphery defining three corresponding active linearly extending slot areas, each slot having a different respectively corresponding resonant dimension associated therewith along a direction substantially transverse to the straight edge which defines such slot,

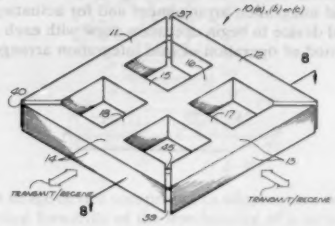
said antenna element surface being shaped such that each of the straight edges lying along at least a portion of a respectively associated one of the three sides of a triangular geometric shape, and

r.f. feed means electrically connected to said antenna element surface for conducting r.f. energy to/from said antenna element surface.

4,012,742
MULTIMODE LOOP ANTENNA

Richard C. Dempsey, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,439
Int. Cl.² H01Q 7/00
U.S. Cl. 343—742 **5 Claims**



1. A multi-mode loop antenna system including a conductive loop for radiation and reception in the plane of the loop, comprising:

a plurality of gaps uniformly spaced about the perimeter of said loop;

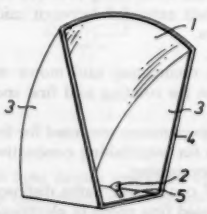
a plurality of spokes equal in number to said gaps radiating from a symmetrically located central area within said loop, said spokes each being conductively joined to said conductive loop at a location midway between an adjacent pair of said gaps, thereby to form a plurality of sub-loops within said loop perimeter;

and feed network means for separately feeding each of said gaps, and for combining said feeds in predetermined phase relationships, said network having at least one port and corresponding mode of operation providing a directional radiation and reception pattern in said plane, said feed phase relationships producing a corresponding direction of instantaneous current flow in each of said sub-loops.

4,012,743
ANTENNA SYSTEM INCLUDING A PARABOLOIDAL REFLECTOR AND AN EXCITER

Kurt Maciejewski, Ludwigsburg, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 6, 1976, Ser. No. 655,983
Claims priority, application Germany, Feb. 8, 1975, 2505375
Int. Cl.² H01Q 15/16
U.S. Cl. 343—781 R **5 Claims**

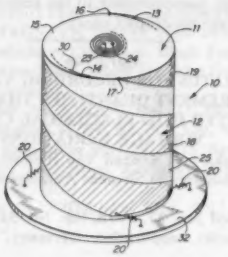


1. In an antenna system comprising a paraboloidal antenna with offset exciting, an approximately horizontal bottom plate, and an exciter which is disposed above the mentioned bottom plate, the improvement wherein: said exciter has a tilt angle of about 50°, said paraboloidal reflector is covered by a dielectric cover plate which is inclined to the vertical so said cover plate and parabola contact in a single plane; a portion of both sides of the width of the parabola is removed, and side sheets are provided to connect the paraboloidal bowl and the cover plate; said exciter is a conical multimode exciter with an aperture angle of about 100° and is provided with at least one concentrically arranged slit on the conical surface of the exciter facing said paraboloidal reflector, the width of said slit is between $\lambda/10$ and $\lambda/20$, the smaller diameter of said conical exciter is about $\lambda/1.2$, and the larger diameter of said conical exciter is about 3λ where λ is the wavelength of the mid-frequency of the operating frequency band of the antenna system.

4,012,744
HELIX-LOADED SPIRAL ANTENNA

John W. Greiser, Marina Del Rey, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 20, 1975, Ser. No. 624,040
Int. Cl.² H01Q 1/36
U.S. Cl. 343—895 **12 Claims**



1. Antenna apparatus comprising:

a. a planar spiral antenna portion, said planar spiral antenna portion having spiral arm means having inner and outer ends;

b. a helical antenna portion coupled to the outer ends of said spiral arm means, said helical antenna portion being substantially coaxial with said planar spiral antenna portion; and,

c. means coupled to the inner ends of said spiral arm means for energizing said antenna.

4,012,745
PHASE CORRECTION SYSTEM

Michael K. Brown, Tecumseh; David E. Lundquist, Birmingham; Leonard P. Bullis, Dearborn, and Arvin D. McGregor, Birmingham, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

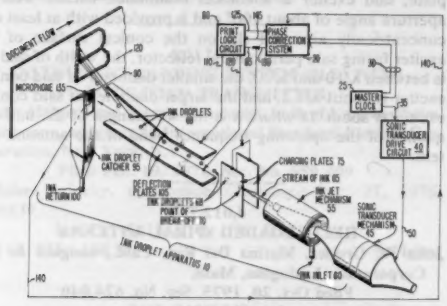
Filed Nov. 28, 1975, Ser. No. 636,024
Int. Cl.² G01D 18/00
U.S. Cl. 346—1 **36 Claims**

1. A device for optimally charging ink droplets for subsequent improved use in providing non-impact printing, comprising:

a. ink jet droplet means for spatially jetting out a stream of ink, transducing the stream into droplets, charging the droplets in a dynamically controlled manner as they are formed, and statically deflecting the charged droplets to describe characters on a surface to be printed; and

b. phase correction means for test charging selected droplets, as they are formed in said ink jet droplet means, clocking through a plurality of discrete relatively narrow serially related phase time signals temporally varying out from and relative to the initializing of the transducing of the droplets, for quantitatively measuring the test charged droplets, as received at a predetermined sensing point in said ink jet droplet means for a given phase time being tested, for evaluating each tested phase time relative to all other tested phase times to determine which phase time

provides the largest quantitative measure of droplet charge, and for controlling the charging of droplets in



timed relation to the transducing of droplets with a phase relationship corresponding to the tested phase time providing maximum droplet charge.

4,012,746

APPARATUS FOR RECORDING VARIABLE MEASUREMENT QUANTITIES THAT CAN BE TRANSLATED INTO ELECTRICAL CURRENT OR VOLTAGE VARIATIONS

Gerd Kuligowski, and Konrad Von Hessberg, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

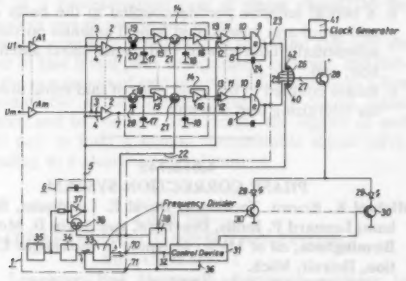
Filed Jan. 27, 1975, Ser. No. 545,344

Claims priority, application Germany, Jan. 29, 1974, 2404550

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.² G01D *9/28, 9/42*

U.S. Cl. 346—35 **8 Claims**



1. Apparatus for use in controlling the operation of a row of light-emitting components, said components being arranged transversely to the direction of motion of a light sensitive record carrier and being used to optically record thereon variable measurement quantities that can be translated into varying electrical signals, comprising:

an amplitude discriminator arrangement for causing said components to emit light onto said record carrier for given values of said quantities including:

a periodically operating integration arrangement having an input and an output;

a voltage reference source connected to said input, and

a number of comparators, each comparator having a first input connected to the output of said integration arrangement and a second input to which one of said electrical signals are applied, each of said comparators further having an output;

an OR logic circuit having a plurality of inputs connected to corresponding ones of said outputs of said comparators;

a first electronic switch having a control terminal coupled to the output of said OR logic circuit;

an auxiliary circuit including said first electronic switch and a first number of further electronic switches, said first electronic switch being arranged in series with said further electronic switches and with said components;

a cyclically operating control device for actuating said further switches; and,

frequency means for controlling the periodic operation of said integration arrangement and for actuating said control device to begin operation anew with each start of the period of operation of said integration arrangement.

4,012,747

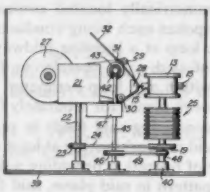
DOUBLE REVOLVING STYLUS ON CONTINUOUS BELT

Reed Albert Newmeyer, Midvale, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,570

Int. Cl.² G01D *15/24*

U.S. Cl. 346—139 A **8 Claims**



1. A stylus carriage, comprising in combination;

an endless belt made of insulating material having a plurality of conductive paths disposed on the inner surface of said belt parallel to each other and to the direction of travel of said belt,

each of said conductive paths comprising a strip of conductive material so spaced on said belt as to be electrically insulated from one another,

a plurality of stylii,

each of said stylii secured to said belt for travel therewith and comprising a plurality of conductive wires formed into a writing tip at one end and electrically connected at the other end to respective ones of said conductive paths,

drive means for continuously driving said belt,

said drive means comprising first and second spool means with said belt extended between said first and second spool means,

motor means,

pulley means connecting said motor means to said first spool means for rotating said first spool means to drive said belt,

said second spool means mounted for free rotation,

circuit means for establishing conductive paths to each of said stylii comprising,

a plurality of conductive paths disposed about the outer surface of said first spool in electrical contact with said conductive paths on said belt,

slip ring assembly means connected to said shaft means for rotation by said motor means,

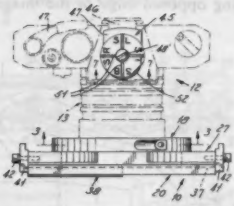
said slip ring assembly means having conductive paths disposed about its outer periphery,

first means electrically interconnecting said conductive paths of said slip ring assembly means to respective ones of said conductive paths of said first spool means.

4,012,748
CAMERA DEVICE FOR OBTAINING A SPLIT IMAGE

Savarian F. Lemanski, 109 Taylor Ave., Detroit, Mich. 48202

Filed May 15, 1975, Ser. No. 577,683
Int. Cl.² G03B 1/00
U.S. Cl. 354—122 6 Claims

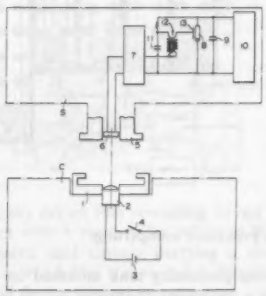


1. A split image device comprising an adaptor member to be fixedly applied forwardly of the lens housing of a camera in a position to intercept transmission of a photographic image, a mask mount on said adaptor member, said mask mount having means to adjustably receive a lens mask member, a lens mask member slidably mounted on the mask mount, said lens mask member being shaped so that it obscures a predetermined, substantial area portion of the lens area therebehind to thus prevent a substantial exposure through the lens area portion thus obscured, said lens mask member being slidable diametrically across the camera lens into and out of different masking positions, said mask mount being rotatably mounted on said adaptor member, and yieldable detent means between said mask mount and said adaptor member to releasably hold the mask mount in different rotatively indexed adjustment settings thereof relative to the lens.

4,012,749
STROBO FLASH LIGHT DEVICE FOR CAMERAS

Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Sept. 29, 1975, Ser. No. 617,635
Claims priority, application Japan, Sept. 30, 1974, 49-111599
Int. Cl.² G03B 15/03, 15/05
U.S. Cl. 354—145 8 Claims

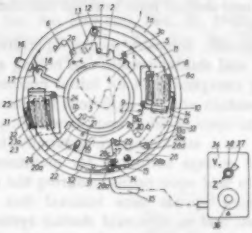


1. A strobo flash light device energized upon release of a shutter in a camera comprising in combination:
- an electric source provided in a camera body,
- a shutter mechanism provided in the camera body,
- a switch connected with said electric source closed upon release of said shutter mechanism,
- a light emitting means connected with said source and said switch for emitting light when said switch is closed,
- an accessory shoe provided on the camera body having means for transmitting the light emitted by said light emitting means,
- a strobo flash light tube provided in a strobo flash light unit casing,
- a strobo flash light tube energizing circuit provided in said casing and connected with said tube, said strobo flash light energizing circuit including a trigger circuit for triggering said tube,
- a photodetecting means provided in said casing for detecting light impinging thereon,
- a foot fixed to said casing to be inserted into said accessory shoe for supporting said casing, said foot having means for transmitting the light emitted by said light emitting means to said photodetecting means when said foot is inserted into said accessory shoe, and
- a switching circuit connected between said photodetecting means and said trigger circuit for closing said trigger circuit when a signal which indicates that the photodetecting means has received light emitted by said light emitting means is given thereto.

4,012,750
CAMERA SHUTTER WITH DIAPHRAGM AND ELECTRO-MAGNETIC DRIVE FOR DIAPHRAGM

Waldemar T. Rentschler, Calmbach, Black Forest, Germany, assignor to Prontor-Werk Alfred Gauthier GmbH, Wildbad, Black Forest, Germany

Continuation of Ser. No. 516,850, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 306,320, Nov. 13, 1972, abandoned. This application May 28, 1975, Ser. No. 581,529
Claims priority, application Germany, Nov. 11, 1971, 2156034
Int. Cl.² G03B 9/00, 9/08, 9/02
U.S. Cl. 354—232 6 Claims



1. Camera shutter assembly which comprises:
- shutter means having actuatable shutter segments for effecting shutter operation,
- shutter drive means including first electromagnetic means having an armature operatively arranged for actuating the shutter segments,
- diaphragm means having diaphragm aperture forming blades operatively arranged for actuation between an adjustable predetermined less than full size aperture operative setting position and a full size aperture position,
- return spring means normally biasing the diaphragm blades to the adjustable predetermined operative setting position, and
- diaphragm drive means including second electromagnetic means having an armature and independently adjustable mechanical intermediate members operatively arranged for forwardly actuating the diaphragm blades against the biasing force of the return spring means from such adjustable predetermined operative setting position to full size aperture position, said diaphragm means being returnable after such actuating to the adjustable predetermined operative setting position under the biasing force of the return spring means,
- the independently adjustable mechanical intermediate members being operatively interposed between the second electromagnetic means and the diaphragm means for adjustment independently of the second electromagnetic

means to vary the predetermined size of the aperture of the operative setting position.

4,012,751

PHOTOGRAPHIC CAMERA WITH ELECTROMAGNETIC ACTUATOR OF THE SHUTTER SEGMENTS

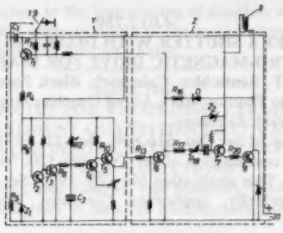
Winfried Espig, Calmbach, Germany, assignor to Prontor-Werk Alfred Gauthier GmbH, Postfach, Germany

Continuation of Ser. No. 511,901, Oct. 3, 1974, abandoned, which is a continuation of Ser. No. 335,585, Feb. 26, 1973, abandoned, which is a continuation of Ser. No. 141,784, May 10, 1971, abandoned. This application May 29, 1975, Ser. No. 582,067

Claims priority, application Germany, May 8, 1970, 2022532

Int. Cl.² G03B 9/08

U.S. Cl. 354—234 **4 Claims**



1. Photographic camera shutter comprising

a segmented shutter system movable to open position for a determined shutter time interval and then back to closed position;

electromagnetic actuator means operatively arranged to actuate said shutter system and having an electromagnet winding energizable at an initial maximum high magnitude constant voltage sufficient for moving said shutter system to open position and immediately thereafter energizable at a sustaining substantially lower magnitude constant voltage sufficient for maintaining said shutter system in said open position during the remainder of the determined shutter time interval that said winding is energized and in turn said shutter system remains open and thereby preventing voltage overload of said winding during said remainder of said shutter time interval;

electronic time setting means for controlling the shutter time interval during which said winding is energized and in turn said shutter system remains open; and

energizable circuit means for said time setting means and said winding and including an electronic switch circuit electrically coupled with said time setting means for providing in regulated time duration sequence the initial high constant voltage and immediately thereafter the sustaining lower constant voltage for energizing said winding within the determined shutter time interval controlled by said time setting means.

4,012,752

SLIT SHUTTER FOR A CAMERA

Waldemar T. Rentschler, and Walter Holzapfel, both of Calmbach, Black Forest, Germany, assignors to Prontor-Werk Alfred Gauthier GmbH, Wildbad, Black Forest, Germany

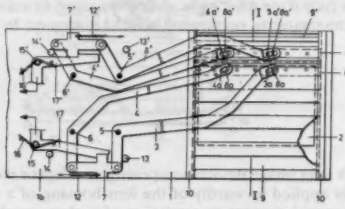
Continuation of Ser. No. 416,220, Nov. 15, 1973, abandoned, which is a continuation of Ser. No. 573,839, May 2, 1975, abandoned. This application Jan. 15, 1976, Ser. No. 649,396

Claims priority, application Germany, Nov. 15, 1972, 2255835

Int. Cl.² G03B 9/32

U.S. Cl. 354—242 **6 Claims**

1. Slit shutter for a photographic camera, comprising a base plate, a camera image window defined in said base plate and having opposed edges, a first cover system having a folding blind curtain for uncovering the image window for photographic exposure and a second cover system having a folding blind curtain adapted to function after the first cover system with a controlled time delay for again covering the image window, means to fix each blind curtain at one end thereof to a corresponding opposed edge of the image window, a rigid



rail means connected at the other end of each blind curtain, said rail means together defining the corresponding edges of the associated slit of the cover system slit shutter, and means for positive displacement of the rail means along a substantially straight line including a pair of corresponding lever-containing parallel linkages pivotally supported on the base plate and having the ends of each linkage positioned displaceably for forming the corresponding edges of the slit of the cover system slit shutter.

4,012,753

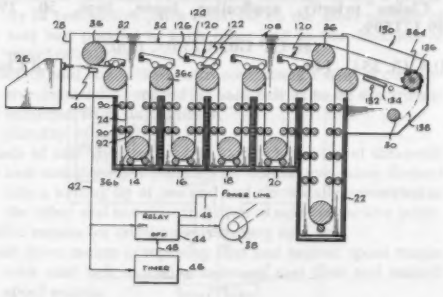
FILM PROCESSOR

Gunter Schmidt, Malibu, Calif., assignor to Cubic Productron, Inc., Chula Vista, Calif.

Filed May 2, 1975, Ser. No. 574,002

Int. Cl.² G03D 17/00, 3/02

U.S. Cl. 354—316 **9 Claims**



1. A film processor comprising:

a frame;

at least one processing tank mounted on said frame, for holding a processing chemical;

means for immersing film in said tank;

drain means for receiving fluid from said processing tank;

controllable means for moving a predetermined volume of fluid from said processing tank to said drain means, to lower the level of fluid in said processing tank; and

level restoring means including means for holding a replenishing container and means which are responsive to and which operates shortly after said controllable means lowers the level of fluid, for flowing fluid from the replenishing container to the processing tank in an amount that restores the level of fluid in the processing tank to a predetermined level.

4,012,754

PHOTOGRAPHIC CAMERA

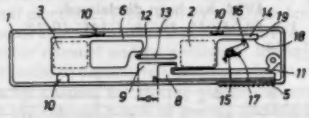
Heinz Waaske, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Mar. 8, 1976, Ser. No. 664,430

Claims priority, application Germany, Mar. 14, 1975, 2511153

Int. Cl.² G03B 1/00

U.S. Cl. 354—212 10 Claims



1. A photographic camera having film transport means, a rectilinearly moved slider for driving said film transport means, and a cover plate operable by means of said slider, said plate having a closed position covering viewfinder and lens openings and having an open position which clears said openings, characterized by the fact that said slider (5) and cover plate (6) are coupled with one another with limited relative movement between them, and that an auxiliary drive (15, 16, 17) is provided for the displacement of the cover plate into its said open position.

4,012,755

ELECTRICAL FILM REWINDING DEVICE

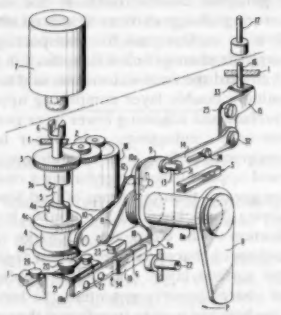
Akihiro Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 2, 1975, Ser. No. 583,030

Claims priority, application Japan, June 5, 1974, 49-63687

Int. Cl.² G03B 1/00

U.S. Cl. 354—214 7 Claims



1. An electrically driven film rewinding device for detachable engagement with a camera for effecting film wind up within said camera, said camera carrying a rotatable film support reel upon which film is rewound during rewind device engagement, said device comprising:

a body,

a camera film rewind drive shaft rotatably mounted within said body and axially movable between an extend position in engagement with the camera mounted film reel and a retracted, nonengaged position when said rewinding device is attached to said camera,

a rewind drive shaft drive motor within said body,

clutch means for operatively connecting said drive motor to said rewind drive shaft for effecting shaft rotation,

an operating shaft rotatably mounted on said body,

a rewind operating lever mounted on said operating shaft for rotation about the operating shaft axis,

a clutch operating and shaft rewind engaging lever resiliently mounted on said operating shaft and rotatable therewith, said rewind operating lever being rotatable from a first position where said shaft is uncoupled from said reel, said motor is disengaged, said clutch means is disengaged, through a second position to a third position wherein said clutch means is in engagement and said rewind drive shaft is projected into coupling relationship with said film support reel,

normally open switch means mounted within said body and being closed in response to rotation of said rewind operating lever from said first position to at least said third position for energizing said motor to rewind said film,

and wherein said camera includes a displaceable film take up releasing member shiftable from a normally film locked position to a film released position, and said rewinding device further includes mechanical interlock means responsive to rotation of said rewind operating lever from said first position to said second position to shift said film take up release member from locked position to released position prior to said rewind operating lever effecting clutch engagement and rewind drive shaft connection with said film support reel when said rewind device is attached to said camera.

4,012,756

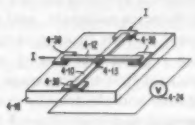
METHOD OF INHIBITING HILLOCK FORMATION IN FILMS AND FILM THEREBY AND MULTILAYER STRUCTURE THEREWITH

Praveen Chaudhari; Francois M. d'Heurle, and Amitava Gangulee, all of Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 889,100, Dec. 30, 1969, abandoned. This application Jan. 27, 1975, Ser. No. 544,462

Int. Cl.² H01L 27/12

U.S. Cl. 357—5 7 Claims



1. A tunnel device exhibiting Josephson tunnelling current, comprising:

a base first film electrode comprised of a first lead superconducting material and a substantially homogeneous distribution of alloying additions present throughout said superconducting material selected from the group of elements consisting of gold and silver in the range of approximately 7 to 10 percent by weight of said superconducting material;

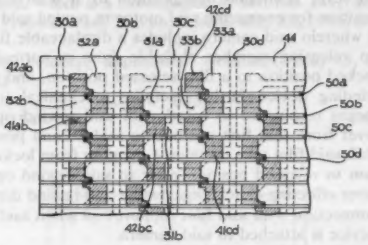
a tunnel barrier in contact with said first superconducting material comprised of an oxide and being sufficiently thin that Josephson current can tunnel therethrough; and

a counter second film electrode in contact with said tunnel barrier comprised of a second lead superconducting material.

4,012,757
CONTACTLESS RANDOM-ACCESS MEMORY CELL AND CELL PAIR

James T. Koo, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed May 5, 1975, Ser. No. 575,034
Int. Cl.² H01L 27/10
U.S. Cl. 357—24 4 Claims



1. An integrated circuit memory formed in a semiconductor substrate having a multiplicity of memory cell pairs, each memory cell pair coupled to one of a plurality of word select lines of said memory and each memory pair coupled to two of a plurality of sense lines of said memory, each of said memory cell pairs comprises:

a first conductive means disposed in said semiconductor substrate for forming a first sense line of said memory and a first region in said memory cell pair;

a second conductive means disposed in said semiconductor substrate for forming a second sense line of said memory and a second region in said memory cell pair;

a conductive gate means insulatively disposed at least in part above a first and second transmission region in said semiconductor substrate, said gate means for controlling electrical current flowing in said first and second transmission regions and having a single electrical contact region, said first transmission region being substantially contiguous and electrically coupled to said first conductive means and said second transmission region being substantially contiguous and electrically coupled to said second conductive means; and

a conductive capacitative means insulatively disposed at least in part above a first and second capacitor region in said semiconductor substrate, said capacitative means operable for storing electrical charge and for inducing said first and second capacitor region into a conductive state, said first capacitor region being substantially contiguous and electrically coupled to said first transmission and said second capacitor region being substantially contiguous and electrically coupled to said second transmission region, wherein:

said first and second conductive means are diffusion regions disposed in said semiconductor substrate in substantially parallel channels;

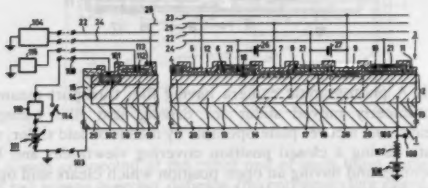
said first transmission and first capacitor regions form a first finger-like projection substantially perpendicular to said first conductive means; and

said second transmission and second capacitor regions form a second finger-like projection substantially perpendicular to said second conductive means, said first and second finger-like projections forming an interdigitated pattern between said first and second conductive means.

4,012,758
BULK CHANNEL CHARGE TRANSFER DEVICE WITH BIAS CHARGE

Leonard Jan Maria Esser, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 452,714, March 20, 1974, abandoned. This application Oct. 2, 1975, Ser. No. 618,928
Claims priority, application Netherlands, Dec. 3, 1973, 7316495
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.
Int. Cl.² H01L 29/78; G11C 19/28
U.S. Cl. 357—24 4 Claims



1. A bulk-channel charge transfer device comprising an elongated semiconductor channel of one-type conductivity, means for isolating the semiconductor channel, means to locally introduce into the semiconductor channel information in the form of signal-modulated quantities of majority charge carriers and means to read-out said information elsewhere in the channel, said semiconductor channel having a thickness measured perpendicularly to a cooperating electrode system and a doping concentration and being maintained at a potential such that it can be fully depleted throughout its thickness in the absence of externally-introduced free charge carriers, a cooperating electrode system comprising plural electrodes separated by a barrier layer from the semiconductor channel and located at least at one side of the semiconductor channel and responsive to the application of potentials thereto to capacitively generate electric fields in the semiconductor channel for storing charge carriers at spaced sites within the channel below its surface and for transporting the charge carriers through the channel below its surface in the longitudinal direction toward the read-out means, said semiconductor channel forming a double layer comprising upper layer portions at the surface and adjoining lower layer portions both of the same one-type conductivity, said upper layer portions forming a continuous surface layer extending under all of the electrodes, said upper surface layer having a one-type dopant concentration greater than ten times of said lower layer portions and having a thickness of the double layer such that during application of the electrodes of charge storage potentials large packets of charge carriers present are mainly stored in said upper surface layer, and during application to the electrodes of charge transfer potentials the last charge fractions of the packets are mainly transferred through said lower layer portions, and means for improving transfer efficiency including means to introduce into the semiconductor channel a constant quantity of majority charge carriers independent of the signal magnitude as a constant background quantity.

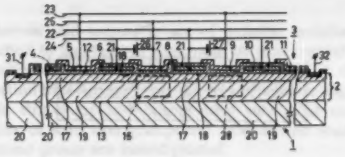
4,012,759
BULK CHANNEL CHARGE TRANSFER DEVICE

Leonard Jan Maria Esser, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 450,996, March 14, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,538
Claims priority, application Netherlands, Mar. 19, 1973, 7303778
Int. Cl.² H01L 29/78; G11C 19/28
U.S. Cl. 357—24 16 Claims

13. A bulk-channel charge transfer device comprising an

elongated semiconductor channel of one-type conductivity, means for isolating the semiconductor channel, means to locally introduce into the semiconductor channel information in the form of majority charge carriers and means to read-out said information elsewhere in the channel, said semiconductor channel having a thickness measured perpendicularly to a cooperating electrode system and a doping concentration and being maintained at a potential such that it is fully depleted throughout its thickness in the absence of locally-introduced free charge carriers, and a cooperating electrode system comprising plural electrodes separated by a barrier layer from the semiconductor channel and located at least at one side of the semiconductor channel and responsive to the application of potentials thereto to capacitively generate electric fields in the semiconductor channel for storing charge carriers at spaced sites within the channel below its surface and for transporting the charge carriers through the channel below its surface in

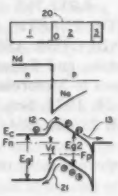


the longitudinal direction toward the read-out means, said semiconductor channel forming a double layer comprising upper layer portions at the surface and adjoining lower layer portions both of the same one-type conductivity, said upper layer portions occupying at least substantial portions of the surface area under the storage electrode portions closer to the read-out means in the transport direction, said upper layer portions each having a one-type dopant concentration greater than ten times that of said lower layer portions and each having a thickness less than one-half the thickness of the double-layer such that during application to the electrodes of charge storage potentials, large packets of charge carriers present are mainly stored in said upper layer portions, and during application to the electrodes of charge transfer potentials, the last charge fractions of the packets are mainly transferred through said lower layer portions, said upper layer portions being fully depleted during normal operation in the absence of locally introduced free charge carriers.

4,012,760
SEMICONDUCTOR COLD ELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 451,754, March 18, 1974, Pat. No. 3,972,060. This application Mar. 22, 1976, Ser. No. 669,237
Int. Cl.² H01L *27/14*
U.S. Cl. 357—30 **3 Claims**



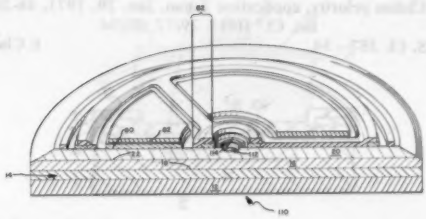
1. A cold emission semiconductor device comprising a first layer of GaAlP, and of several hundred Angstroms thickness and of n-type conductivity; a second layer of GaAlP of p-type conductivity and of a thickness less than the diffusion length of electrons, and whose effective forbidden band gap is smaller than that of said first layer, said first and said second layers being intimately in contact with each other through epitaxial growth and with substantial lattice match to form a heterojunction, said second layer having a surface opposite said heterojunction with zero or negative electron affinity for emission of electrons, a first electrode connectable to said first layer, and a second electrode connectable to said second layer with the distance between said second electrode and said heterojunction being more than the diffusion length of electrons, and means for applying a potential to said electrodes to bias said heterojunction and cause said first layer to generate electrons which are subsequently injected into said second layer and without substantially any recombination and emitted from said surface of said second layer,

wherein the impurity concentration of said second layer gradually decreases from said heterojunction to said surface opposite said heterojunction.

4,012,761
SELF-PROTECTED SEMICONDUCTOR DEVICE

Armand P. Ferro, Schenectady, and Victor A. K. Temple, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 19, 1976, Ser. No. 677,876
Int. Cl.² H01L *29/74*
U.S. Cl. 357—38 **14 Claims**



1. A self-protected semiconductor device comprising:

a main thyristor section;

a pilot thyristor section operatively associated with said main thyristor section to turn on said main thyristor section when said pilot thyristor section is turned on,

first gate means operatively associated with said pilot thyristor section for turning said pilot thyristor section on in response to the application of a gate signal to said gate means;

an auxiliary pilot thyristor section surrounding said main thyristor section for turning on said main thyristor section when said auxiliary pilot thyristor section is turned on;

second gate means surrounding said auxiliary pilot thyristor section for turning on said auxiliary pilot thyristor section in response to leakage currents generated at the onset of avalanche voltage breakdown of the device.

4,012,762
SEMICONDUCTOR FIELD EFFECT DEVICE HAVING OXYGEN ENRICHED POLYCRYSTALLINE SILICON

Motoaki Abe, Hiratsuka, and Teruaki Aoki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 16, 1975, Ser. No. 587,153
Claims priority, application Japan, June 24, 1974, 49-72078
Int. Cl.² H01L *29/34*
U.S. Cl. 357—52 **7 Claims**

1. A metal insulator semiconductor field effect transistor structure comprising,

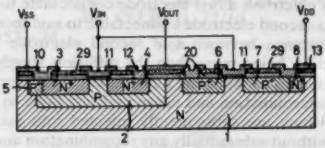
a. a substrate of semiconductor material of one conductivity type having one major surface,

b. source and drain region of another conductivity type produced in said substrate,

c. gate insulating layer and gate electrode disposed between said source and drain region on said major surface,

d. a layer of polycrystalline silicon containing oxygen in the range of 2 to 40 atomic percent in electrical contact with parasitic portions of said one major surface,

e. a silicon dioxide layer overlaying and extending along at



least one portion of said layer of polycrystalline silicon, and

f. an interconnection layer of conductive material overlaying and extending along at least one portion of said silicon dioxide layer.

4,012,763

SEMICONDUCTOR DEVICE HAVING INSULATOR FILM WITH DIFFERENT PRESCRIBED THICKNESS PORTIONS

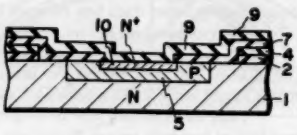
Eiichi Yamada; Yasunobu Kosa, and Eiichiro Sato, all of Kodaira, Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 221,014, Jan. 26, 1972, Pat. No. 3,801,383. This application June 25, 1973, Ser. No. 372,900

Claims priority, application Japan, Jan. 29, 1971, 46-2825

Int. Cl.² H01L *29/72, 29/34*

U.S. Cl. 357—54 **6 Claims**



1. In a transistor comprising a semiconductor substrate, a base and an emitter region formed on a major surface of the substrate, and an insulating film covering said major surface of the substrate, the improvement which is characterized by said insulating film including a first portion having a constant thickness and uniform composition disposed on said base and emitter regions and the substrate surface portion adjacent to said base region so as to cover the edges of the PN junctions formed between the adjoining semiconductor regions and the substrate, and a second portion of a thickness larger than that of said first portion so as to surround said first portion of the film but so as to be spaced from the junction formed between the base region and the substrate.

4,012,764

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Koichiro Satonaka, Fuchu, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 4, 1975, Ser. No. 637,575

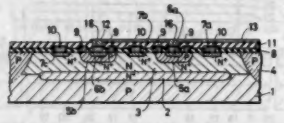
Claims priority, application Japan, Dec. 4, 1974, 49-138411

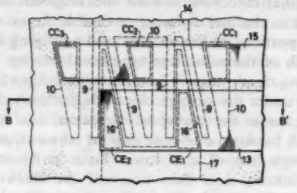
Int. Cl.² H01L *29/72, 27/02, 29/34, 23/48*

U.S. Cl. 357—68 **1 Claim**

1. In a semiconductor integrated circuit device which comprises at least a transistor comprising a semiconductor substrate including at least a single collector region of a first conductivity type, a plurality of base regions of a second conductivity type formed in said collector region, and emitter regions of the first conductivity type respectively formed in the base regions of the second conductivity type, the plurality of second conductivity type base regions being electrically commonly connected with one another, the plurality of first conductivity type emitter regions being electrically commonly connected with one another,

a semiconductor integrated circuit device which comprises a first layer of insulating film formed on one principal surface of said semiconductor substrate, the first-layer insulating film being formed with a plurality of emitter first-layer window opening portions for exposing the greater parts of surface portions of said plurality of emitter regions on said one principal surface of said semiconductor substrate, with a plurality of base first-layer window opening portions for exposing the greater parts of surface portions of said plurality of base regions, and with a plurality of collector first-layer window opening portions for exposing the plurality of places of a surface portion of said single collector region; a first electrode interconnection layer, said interconnection layer forming a plurality of emitter first electrode layers or a single such layer respectively or commonly held in ohmic contact with said plurality of emitter regions through said plurality of emitter first-layer window opening portions, a single





base first electrode interconnection layer commonly held in ohmic contact with said plurality of base regions through said plurality of base first-layer window opening portions, and a plurality of collector first electrode layers respectively held in ohmic contact with said collector region in said plurality of collector first-layer window opening portions; a second layer of insulating film formed on said first-layer insulating film and said first electrode interconnection layer, the second-layer insulating film being formed at least with a plurality of collector second-layer window opening portions for exposing at least parts of surface portions of said plurality of collector first electrode layers; and a second electrode interconnection layer, said interconnection layer forming at least a single collector second electrode interconnection layer electrically commonly connected with said plurality of collector first electrode layers through said plurality of collector second-layer window opening portions.

4,012,765

LEAD FRAME FOR PLASTIC ENCAPSULATED SEMICONDUCTOR ASSEMBLIES

Leo L. Lehner, Scottsdale, and Eugene E. Segerson, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 24, 1975, Ser. No. 616,456

Int. Cl.² H01L *23/48, 29/44, 29/52, 29/60*

U.S. Cl. 357—70 **3 Claims**

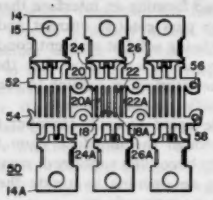
1. A lead frame for the assembly of semiconductor devices comprising:

a. a first group of metallic members including a first die mount portion and semiconductor device leads;

b. a first metallic interconnecting band attached to said device leads at a point in proximity to said first die mount portion, said attachments holding said device leads in a predetermined alignment;

c. a second metallic interconnecting band attached to said device leads, said second interconnecting and spaced away from said first interconnecting band in a direction away from said first die mount portion;

b. a second group of metallic members including a second die mount portion and semiconductor device leads



wherein said second group of metallic members are attached to and held in alignment by said second interconnecting strip in the vicinity of said second die mount portion and further attached to and held in alignment by said first interconnnecting strip such that said device leads of said first group and said device leads of said second group are interdigitated.

4,012,766

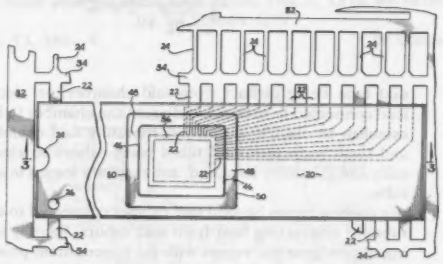
SEMICONDUCTOR PACKAGE AND METHOD OF MANUFACTURE THEREOF

Alvin B. Phillips, Newport Beach; Martin Monciardini; Douglas A. Mills, both of Santa Ana, and Daniel Brors, Mission Viejo, all of Calif., assignors to Western Digital Corporation, Newport Beach, Calif.

Continuation of Ser. No. 392,347, Aug. 28, 1973, abandoned. This application Oct. 8, 1975, Ser. No. 620,572

Int. Cl.² H01L *23/48, 23/28;* **H02G** *13/08;* **B01J** *17/00*

U.S. Cl. 357—70 **13 Claims**



1. An electronic device package to provide coupling between a plurality of external terminals and internal terminals within said package comprising:

a molded package body defining an opening extending through said package body through an upper and lower surface of said package body, said package body having a receiving surface formed adjacent to the perimeter of said opening;

a plurality of leads disposed in a common plane within said package body, said plurality of leads extending through said package body into said opening, said plurality of leads having a central member interconnecting each of said plurality of leads at an end of each lead terminating within said opening, said plurality of leads being disposed within said package body, with said central member intact, said central member being removable to allow said plurality of leads to be electrically separated after said plurality of leads are permanently fixed within said package body, said separated plurality of leads forming said internal terminals at the end of said leads terminating within said opening and forming said external terminals at the end of said leads terminating outside said package body;

a device mounting member having a pheripherial surface engaging said receiving surface of said package body, and having a generally flat platform surface disposed within said opening by a preselected displacement;

an electronic device having a lower surface affixed to said platform surface, and an upper surface of said electronic device being disposed within said opening so as to lie in a substantially common plane with an upper surface of each lead of said plurality of leads;

means for coupling said electronic device to said plurality of leads; and

means for sealing said opening in said package body.

4,012,767

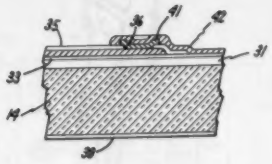
ELECTRICAL INTERCONNECTIONS FOR SEMI-CONDUCTOR DEVICES

Dale M. Brown; Marvin Garfinkel, both of Schenectady, and Mario Ghezzo, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,092

Int. Cl.² H01L *23/48, 29/46, 29/54, 29/62*

U.S. Cl. 357—71 **12 Claims**



1. In combination,

a substrate a semiconductor material having a major face,

a first conductive member of a light transmissive metallic oxide material overlying said substrate,

a second conductive member of aluminum,

a third conductive member in low impedance ohmic contact with said first and second conductive members.

4,012,768

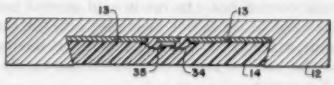
SEMICONDUCTOR PACKAGE

Glenn E. Kirk, Mesa, and Alfred L. Medesha, Apache Junction, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,245

Int. Cl.² H01L *23/28, 23/48, 23/02*

U.S. Cl. 357—72 **5 Claims**



1. A semiconductor integrated circuit device comprising:

a. a plurality of metallic lead members planarly disposed in two groups on either side of a longitudinal axis;

b. a mounting portion positioned between said two groups of metallic lead members and having a first and a second surface substantially parallel to the plane of the metallic lead members;

c. a semiconductor chip having a first surface bonded to said first surface of said mounting portion and having a second surface having a plurality of electrodes thereon, said electrodes electrically connected to said metallic lead members;

d. plastic encapsulation means for enclosing and holding in alignment said metallic lead members, said mounting portion and said semiconductor chip, a surface of said plastic encapsulation means being planarly coincident with said second surface of said mounting portion such that said second surface of said mounting portion is exposed; and

e. a metallic heat sink having a recess transverse to said longitudinal axis, said recess adapted to receive said plastic encapsulation means wherein said surface of said plastic encapsulation means is insulatively joined to the surfaces of said recess with said groups of metallic lead members extending beyond the sides of said metallic heat sink.

4,012,769

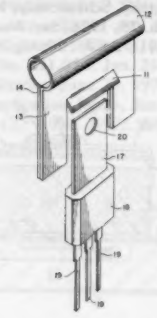
HEAT SINK WITH PARALLEL FLAT FACES

Steven F. Edwards, and James D. Pritchett, both of Dallas, Tex., assignors to Thermalloy Incorporated, Dallas, Tex.

Filed Aug. 4, 1975, Ser. No. 601,920

Int. Cl.² H01L *23/02, 23/28;* **E28F** *7/00;* **H01B** *7/24*

U.S. Cl. 357—81 **7 Claims**



1. Unitary heat sink apparatus comprising a substantially cylindrical body of thermally conductive material having a pair of mutually opposed substantially flat members extending radially outwardly from said cylindrical body, the opposed faces of said radially extending members being resiliently urged into mutual contact by the substantially cylindrical body, each of said opposed faces having a notch therein, said notches lying in register and defining an open-ended space for receiving the body of a semiconductor encapsulation device having a central body with leads extending from one end of said body and a thermal conductor tab extending from the opposite end of said body when said thermal conductor tab is grippingly held between said opposed faces, the sides of said flat members defining said notches extending along opposite sides of said central body to retain said central body within said notches and to act as fins extending into the surrounding environment, at least one of said flat members having the edge thereof at the base of said notch flared outwardly from the opposed flat member.

4,012,770

COOLING A HEAT-PRODUCING ELECTRICAL OR ELECTRONIC COMPONENT

Milton F. Pravda, and Walter B. Bienert, both of Baltimore, Md., assignors to Dynatherm Corporation, Cockeysville, Md.

Filed Sept. 28, 1972, Ser. No. 293,005

Int. Cl.² H01L *23/42;* **F28D** *15/00*

U.S. Cl. 357—82 **12 Claims**

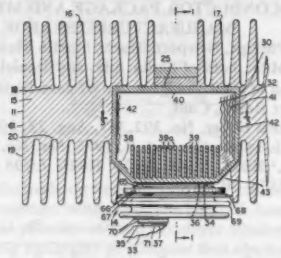
1. Apparatus for cooling a heat-producing power semiconductor comprising a pair of enclosed vapor chambers each having a depth of approximately the same order of magnitude as the depth of the semiconductor, each chamber having a wall which is in tight mating contact with one face of a pair of opposed faces of said semiconductor, said tight mating contact being provied by clamping means holding the vapor chambers to the semiconductor, said chambers and semiconductor being enclosed in a cabinet,

a layer of low melting point metal between each said wall and face and forming an interface therebetween which is effective to pass electric current and heat thereacross, said metal being solid at ambient conditions but having a metal point sufficiently low that the passage of heat through the interface is enough to melt the metal and to form a liquified metal interface,

a vaporizable agent in each chamber for absorbing heat passing through the interface from the semiconductor and thereby becoming vaporized, means in each chamber comprising an opening in a side thereof for removing resulting vapors therefrom,

a plurality of spaced fins extending from the inner surface of said wall for a substantial distance at least part of the way across said chamber, said fins being elongated and closely spaced and having capillary means in contact therewith which impart to the fins a wicking action, said capillary means being saturable by said agent in liquefied state, and the diameter of each chamber being greater than its depth to insure effective wicking action,

an electrically and thermally conductive tube connected to said opening of each chamber and extending out of said cabinet for transferring vapors away from said chambers,



said tube being distinct from said chamber, an electric lead connected to each tube adjacent the chamber to help establish an electric circuit incorporating said chambers and semiconductors, said tubes being otherwise electrically and thermally insulated, and capillary means in each tube,

vapor cooling means beyond said cabinet connected to each tube for abstracting heat from said vapors, thereby serving to condense the vapors with the concomitant production of heat of condensation,

a finned heat sink in heat exchange relation with each said vapor cooling means for dissipating said abstracted heat and said heat of condensation,

a liner of an electrically insulating, thermally conducting material between each said vapor cooling means and said heat sink whereby the latter is electrically non-conducting but thermally conducting,

and said condensed vapors being transferrable by the capillary means in said tubes from said vapor cooling means back to said vapor chambers and being transferrable by the capillary means in the chambers to an area adjacent each interface where they may be re-vaporized and again made effective to absorb heat from said interface.

7. A heat sink for cooling a heat-producing electrical or electronic component comprising a pair of enclosed vapor chambers having a depth of approximately the same order of magnitude as the depth of the component, each chamber having an electrically and thermally conductive wall which is in tight mating contact with a face of said component, clamp-

ing means for holding the chambers and component in said tight mating contact, said mating contact forming an interface which is effective to pass electric current and heat thereacross in a direction substantially normal to said interface, a plurality of closely spaced elongated fins extending from the inner surface of said wall for a substantial distance at least part of the way across said chamber, said fins having capillary means in contact therewith which impart to the fins a capillary or wicking action, a second capillary means in the chamber occupying the chamber volume not occupied by the fins, a vaporizable agent in the chamber occupying the space between fins and effective to absorb heat from the component across the interface, thereby becoming vaporized,

the diameter of said chamber being greater than its depth to insure effective wicking action,

vapor cooling means in thermal contact with each chamber and disposed externally thereof for abstracting heat from said vapors, thereby serving to condense the vapors with the concomitant production of heat of condensation, said vapor cooling means comprising a web in said heat sink having a recess in which said vapor chamber is tightly disposed in a state of compression, said chamber having electrically conductive walls for passing current from the interface to said web, an electrical lead attached to each said web for introducing current to, and removing current from, said heat sink,

and means for dissipating heat from said vapor cooling means comprising fins on upper and lower sides of said web which extend in a direction substantially normal to end faces of said web.

4,012,771

APPARATUS FOR RECORDING AND/OR REPRODUCING COLOR VIDEO SIGNALS

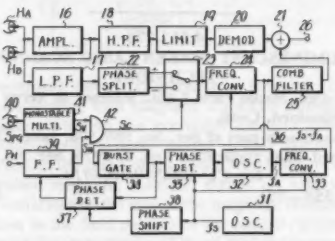
Yoshio Ishigaki, Tokyo; Takao Tsuchiya, Fujisawa, and Tsutomu Niimura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 544,831, Jan. 28, 1975, abandoned. This application Jan. 23, 1976, Ser. No. 651,791

Claims priority, application Japan, Feb. 5, 1974, 49-14746

Int. Cl.² H04N 5/79

U.S. Cl. 358—4 **28 Claims**



1. In an apparatus for reproducing video signals having luminance and chrominance signal components and comprised of field intervals and line intervals which are recorded in respective areas of successive parallel tracks on a record medium with said chrominance signal components of video signals recorded in next adjacent tracks having different first and second carriers: the combination of rotational transducer means for scanning along said tracks one at a time so as to reproduce the video signals recorded in each of said tracks along with cross-talk signals from the tracks next adjacent thereto, pulse signal generating means for producing pulse signals indicating the rotational positioning of said transducer means, means for separating said chrominance signal components from the luminance signal components in the reproduced signals, means for extracting horizontal synchronizing signals from said reproduced signals, signal processing means for providing the separated chrominance signal components of video signals reproduced from each of said tracks with a common carrier and for eliminating from the resultant chrominance signal components the chrominance signal components of the cross-talk signals on the basis of said different first and second carriers with which the chrominance signal components are recorded in the tracks which are next adjacent to each other, phase detecting means for detecting phase reversals of said common carrier of said resultant chrominance signal components, and means for controlling said signal processing means in response to said pulse signals, said horizontal synchronizing signals and said phase detecting means so as to maintain continuity of the phase of said common carrier of the resultant chrominance signal components.

4,012,772

CONVERSION OF COLOR TELEVISION SIGNALS TO OR FROM INTERLACED FORM

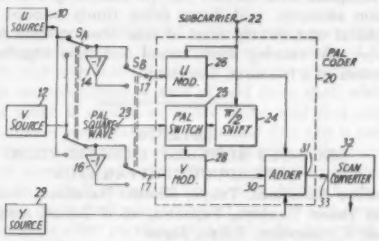
John Philip Chambers, and Derek Thomas Wright, both of Copthorne, England, assignors to The Marconi Company Limited and Standard Telephone & Cables Limited, both of London, England

Filed Sept. 9, 1975, Ser. No. 611,673

Claims priority, application United Kingdom, Sept. 13, 1974, 40114/74

Int. Cl.² H04N 9/42

U.S. Cl. 358—11 **6 Claims**



1. The combination comprising:

scan conversion apparatus for the conversion of color television signals from sequential to interlace form or from interlace to sequential form or from one interlace form to another; and

a PAL or NTSC color encoder connected to said conversion apparatus and having inputs for receiving color signals and subcarrier signals and modulation means connected to said inputs for quadrature modulating two received color signals onto said subcarrier signal;

wherein the output of said encoder is connected to the input of said conversion apparatus, and there being further included controllable phase shift means connected to one or more of the inputs of said encoder, which means is adapted to vary the phase of the modulated color subcarrier for each line of received color signals by substantially an integral number of quarter cycles in dependence upon the line number, such that the output of said conversion apparatus provides an encoded output signal with the color subcarrier in PAL or NTSC format.

4,012,773

COLOR TELEVISION PICTURE TUBES WITH IMPROVED IMPLOSION PROTECTION SYSTEM

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

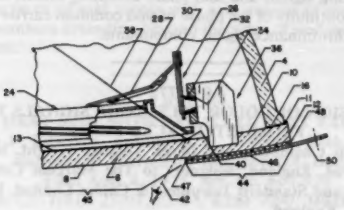
Filed Nov. 17, 1975, Ser. No. 632,559

Int. Cl.² H04N 5/65

U.S. Cl. 358—245 **4 Claims**

1. A rectangular, shadow mask type color television picture tube including a glass tube with a flangeless curved faceplate

which has a concave rear surface with a phosphor screen deposited on a central portion thereof, and shadow mask suspension elements located on said rear surface in each peripheral corner region of said faceplate, said glass bulb also having a funnel which mates with said concave rear surface of said faceplate to define a sealing interface, said faceplate having a convex front surface with a rectangular central area through which television pictures are viewed and a relatively wide peripheral non-viewing area surrounding said central viewing area and overlying said elements, said tube being



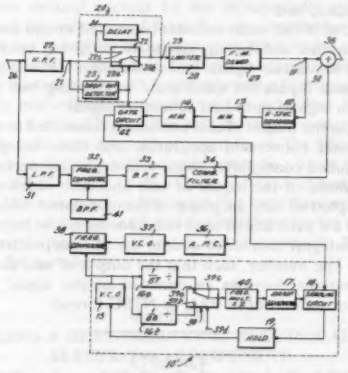
characterized by having a low cost facebond implosion protection system comprising a high-tensile strength frame having a curvature corresponding to the curvature of said front surface of said faceplate and having substantially the same rectangular shape and size thereof, said frame having a substantially rectangular central window at least as large as said viewing area of said faceplate front surface but not extending over said suspension elements, said frame being firmly bonded to said peripheral non-viewing area of said front surface so as to environ said viewing area thereof and hold together glass fragments of a fractured faceplate.

4,012,774

DROP-OUT RESPONSIVE COLOR VIDEO REPRODUCING APPARATUS

Yasunobu Kuniyoshi, Tokyo; Hisaaki Narahara, Musashino, and Takao Tsuchiya, Fujisawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 18, 1976, Ser. No. 659,009
Claims priority, application Japan, Feb. 20, 1975, 50-21264
Int. Cl.² H04N 5/76
U.S. Cl. 358—8 **15 Claims**



1. An apparatus for processing reproduced color video signals which are composed of a frequency-modulated luminance component containing synchronizing pulse signals and a frequency-converted chrominance component having a carrier frequency substantially lower than a standard frequency therefor, said apparatus comprising:

drop-out compensating means responsive to a drop-out in said luminance component for inserting, in the interval of said drop-out, an earlier occurring portion of said luminance component;

means for separating the synchronizing pulse signals from the luminance component following the compensation of the latter by said drop-out compensating means; and

frequency-reconverting means including a frequency converter receiving said chrominance component, means for generating a frequency-reconverting signal which is applied to said frequency-reconverting means for causing the latter to restore the carrier frequency of said chrominance component to said standard frequency thereof, means for controlling the frequency of said frequency-reconverting signal in response to said separated synchronizing pulse signals, and means responsive to a drop-out in said luminance component for maintaining the frequency of said frequency-reconverting signal at a previously determined value during said drop-out.

4,012,775

SYSTEM FOR STABILIZING CATHODE RAY TUBE OPERATION

Clyde Smith, North Salem, N.Y., assignor to Thomson CSF Laboratories, Inc., Stamford, Conn.

Filed Apr. 28, 1975, Ser. No. 572,169
Int. Cl.² H04N 9/12
U.S. Cl. 358—29 **20 Claims**

11. In a video display apparatus which includes a cathode ray tube having a plurality of electron guns and means for applying a plurality of television video signals representative of color picture information to said electron guns; a system for balancing the color screen temperature of said cathode ray tube, comprising:

means for generating first and second test signals during the vertical blanking intervals of said television video signal;

means for applying said first and second test signals to said electron guns during first and second portions, respectively, of said vertical blanking intervals;

means for sampling the beam current of each electron gun during said first and second portions and for generating first and second correction signals, respectively, for each electron gun in accordance with the sampled values; and

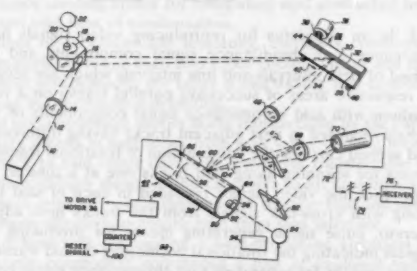
means for applying said first and second correction signals to their respective electron guns so as to balance the screen color temperature of said cathode ray tube.

4,012,776

LUMINESCENT SCREEN LASER SCANNING TECHNIQUE

Peter Mrdjen, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 589,106, June 23, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,313
Int. Cl.² H04N 9/10, 9/14
U.S. Cl. 358—75 **42 Claims**



1. Apparatus for scanning an original document with light of at least two colors, said original document comprising a plurality of elemental lines, comprising:

laser means for providing a laser beam of a first color,

means for supporting an original document at a first location,

means for providing light of at least two colors comprising first means for generating light of a second color when irradiated by said laser beam, and second means for generating light of a third color when irradiated by said laser beam,

rotatable scanning means positioned to direct said laser beam to said light providing means, said scanning means changing the direction of said laser beam during the rotation thereof in order to move said laser beam along a scan line at said light providing means,

means for focusing the light generated by scanning said first and second light generating means as a scanning spot on said original document, and

means for moving said rotatable scanning means and said supporting means in a manner whereby each elemental line on said original document is scanned at least by light of said second and third colors.

4,012,777

RECORD CARRIER AND DEVICE FOR PLAYING BACK SAME

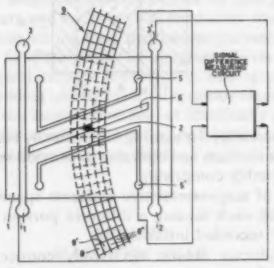
Frederik Ate de Jonge, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 547,993, Feb. 7, 1975, abandoned. This application Dec. 15, 1975, Ser. No. 640,485

Claims priority, application Netherlands, Feb. 28, 1974, 7402690

Int. Cl.² G11B *5/02, 21/02, 5/12*

U.S. Cl. 360—77 **8 Claims**



1. A recording device comprising a magnetic converter element cooperating with magnetic tracks on a magnetizable record carrier, wherein the converter element comprises a sheet of magnetizable material having an easy axis of magnetization normal to the plane of the sheet, which sheet comprises a single-walled magnetic domain, means on said sheet for detecting variations of the size of the magnetic domain caused by variations in the field pattern of the record carrier, means on said sheet for detecting a shift of said magnetic domain with respect to said tracks, and means for correcting the position of the domain in the sheet with respect to said tracks.

4,012,778

LINEAR ACTUATOR

James L. Johnson, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,206

Int. Cl.² G11B *21/08, 5/55;* **F16H** *27/04*

U.S. Cl. 360—78 **19 Claims**

16. In a disk drive including a support frame, a magnetic recording disk mounted to said support frame for rotation about its axis, and at least one electromagnetic head mounted to a carriage and positionable relative to said magnetic recording disk by movement of said carriage along a predefined path, an improved linear actuator for selectively moving said carriage relative to said support frame along said predefined linear path, said improved linear actuator comprising:

a drive shaft having a cylindrical surface:

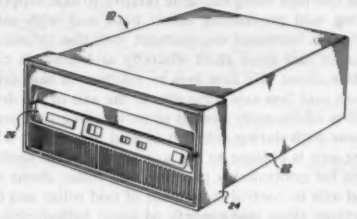
means for rotatably mounting said drive shaft to said frame for rotation of said drive shaft about the axis of said cylindrical surface;

means coupled to said drive shaft for rotating said drive shaft about said axis;

said carriage which forms part of a head carriage assembly, the remainder of said assembly being mounted to said carriage and including said at least one electromagnetic head and a roller;

means for mounting said roller to said carriage with said roller being rotatable about a first axis and pivotable about a second axis perpendicular to said first axis;

means for mounting said carriage to said support frame with



said carriage and thus said assembly being movable relative to said support frame along said predefined linear path, and with said roller being in frictional engagement with the cylindrical surface of said drive shaft whereby said roller is caused to rotate about said first axis by rotation of said drive shaft when said first axis is parallel to the axis of the drive shaft and is additionally caused to move along said predefined linear path during rotation of said drive shaft when said first axis is oblique to the axis of said drive shaft, the center of mass of said assembly lying along a line parallel to the axis of the drive shaft and substantially intersecting or at least closely adjacent the nip between said roller and said cylindrical surface; and

means for controllably pivoting said roller about said second axis to control movement of said roller and thus said carriage and said assembly along said predefined linear path during rotation of said drive shaft.

4,012,779

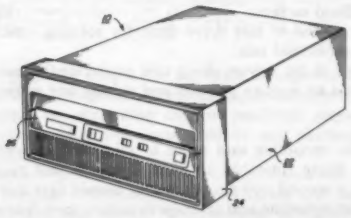
LINEAR ACTUATOR

Russell K. Brunner, Santa Clara, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,332

Int. Cl.² G11B *21/08, 5/55;* **F16H** *27/04*

U.S. Cl. 360—78 **4 Claims**



3. In a disk drive including a support frame, a magnetic recording disk mounted to said support frame for rotation about its axis, and at least one electromagnetic head mounted

to a carriage and positionable relative to said magnetic recording disk by movement of said carriage along a predefined path, an improved linear actuator for selectively moving said carriage relative to said support frame along said predefined linear path, said improved linear actuator comprising:

a drive shaft having a cylindrical surface;

means for rotatably mounting said drive shaft to said frame for rotation of said drive shaft about the axis of said cylindrical surface;

means coupled to said drive shaft for rotating said drive shaft about said axis;

a roller havin having peripheral surface of convex cross-sectional configuration;

means for mounting said roller to said carriage with said roller being rotatable about a first axis and pivotable about a second axis perpendicular to said first axis;

means for mounting said carriage to said support frame with said carriage being movable relative to said support frame along said predefined linear path and with said roller being in frictional engagement with the cylindrical surface of said drive shaft whereby said roller is caused to rotate about said first axis by rotation of said drive shaft when said first axis is parallel to the axis of the drive shaft and is additionally caused to move along said predefined linear path during rotation of said drive shaft when said first axis is oblique to the axis of said drive shaft; and

means for controllably pivoting said roller about said second axis to control movement of said roller and thus said carriage along said predefined linear path during rotation of said drive shaft.

4,012,780

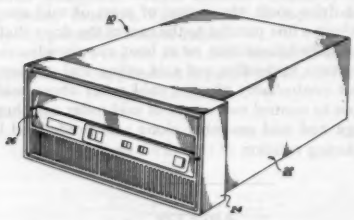
LINEAR ACTUATOR

James L. Johnson, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,205

Int. Cl.² G11B *21/08, 5/55*

U.S. Cl. 360—78 **7 Claims**



1. A linear actuator for selectively moving a carriage relative to a support frame along a predefined linear path, comprising:

a drive shaft having a cylindrical surface;

means for rotatably mounting said drive shaft to said frame for rotation of said drive shaft about the axis of said cylindrical surface;

means coupled to said drive shaft for rotating said drive shaft about said axis;

a carriage to be driven along said predefined linear path between an inactive position and at least one active position;

a roller;

means for mounting said roller to said carriage with said roller being rotatable about a first axis and pivotable about a second axis perpendicular to said first axis;

means for mounting said carriage to said support frame with said carriage being movable relative to said support frame along said predefined linear path between said inactive and at least one active position and with said roller being in frictional engagement with the cylindrical surface of said drive shaft whereby said roller is caused to rotate about said first axis by rotation of said drive shaft when said first axis is parallel to the axis of the drive shaft and is additionally caused to move along said predefined linear path during rotation of said drive shaft when said first axis is oblique to the axis of the drive shaft, said means for mounting said carriage to said support frame including means for biasing said roller against said cylindrical surface with a first level of force when said carriage is at said at least one active position and with a second level of force when said carriage is at said inactive position; and

means for controllably pivoting said roller about said second axis to control movement of said roller and thus said carriage along said predefined linear path during rotation of said drive shaft.

4,012,781

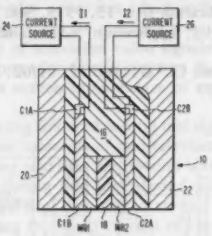
MAGNETORESISTIVE READ HEAD ASSEMBLY FOR SERVO OPERATION

Charles Chia-Hsiung Lin, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,693

Int. Cl.² G11B *5/30, 5/22, 21/10*

U.S. Cl. 360—113 **9 Claims**



1. A head assembly for sensing magnetically recorded information from a medium and operable to provide servo information, said assembly comprising:

a plurality of magnetoresistive elements spaced from each other with each sensing a different portion of the same magnetic recorded information;

a first conductor means electrically connected to each element at alternating ends;

a second conductor means electrically connected to each element such that the outer edge of each second conductor means is on a dividing line defining the centerline or the track boundary of the magnetic flux transitions sensed by one element and its adjacent element such that essentially no dead band remains therebetween;

means for applying a current to each of said first and second conductor means; and

biasing means for providing a magnetic operating bias for said elements at least between said first and second conductor means for sensing the magnetically recorded information.

4,012,782

READ-ONLY INTEGRATED MAGNETIC HEAD

Jean-Pierre Lazzari, Montfort L'Amaury, France, assignor to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Aug. 12, 1975, Ser. No. 604,058

Claims priority, application France, June 19, 1975, 75.19167

Int. Cl.² G11B *5/20, 5/14*

U.S. Cl. 360—123 **17 Claims**

1. A read-only integrated magnetic head device subject to spurious electro-magnetic fields which are generated exter-

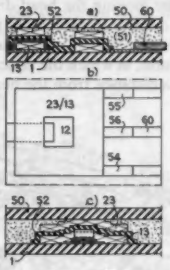
nally to the head by neighboring electro-magnetic field sources comprising:

a non-magnetic sub-strate having front and rear edges;

first and second flat-conductor winding coils of substantially identical dimensioning and coverage supported on said sub-strate;

output leads extending from said first and second flat conductor winding coils to the said rear edge of said sub-strate;

a pair of magnetic pole-piece layers spaced apart at front edges thereof to define a magnetic gap at said front edge



of said sub-strate and having a part of said first flat conductor winding coil inserted between them;

means decoupling said second flat conductor winding coil from any magnetic field generated by said pair of pole-piece layers and said first flat conductor winding coil;

means for eliminating from the readout current any component due to spurious electro-magnetic fields by opposing the electrical current generated in said second flat conductor winding coil by external spurious electro-magnetic fields by the current component identically generated in said first flat conductor winding coil by the same external spurious electro-magnetic fields.

4,012,783

MAGNETIC HEAD

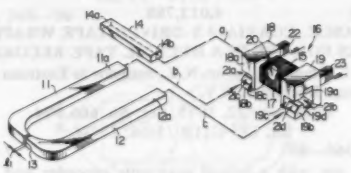
Naohiro Hanaoka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1976, Ser. No. 648,919

Claims priority, application Japan, Jan. 20, 1975, 50-8573; Jan. 24, 1975, 50-10291

Int. Cl.² G11B *5/12*

U.S. Cl. 360—125 **4 Claims**



1. A magnetic head comprising a pair of core pieces having a spacer interposed therebetween to define a gap, a yoke interconnecting the ends of the core pieces which are remote from the gap, a bobbin having a pair of flanges at its opposite ends which are adapted to maintain portions of the core pieces and the yoke which are to be bonded together in abutting engagement when they are engaged with the flanges, and a coil disposed on the bobbin intermediate the flanges.

4,012,784

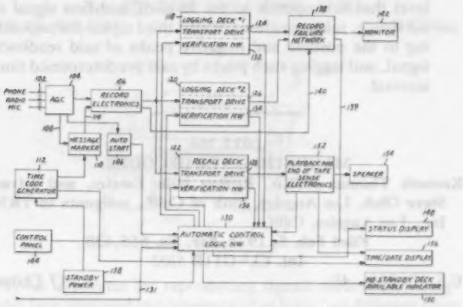
VOICE LOGGING RECORDER INCLUDING DECKS DEDICATED FOR BOTH LOGGING AND RECALL OPERATIONS

Robert L. Murphy, Oxnard, and Dan J. Argento, Thousand Oaks, both of Calif., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Nov. 28, 1975, Ser. No. 635,871

Int. Cl.² G11B *15/02, 27/30*

U.S. Cl. 360—5 **13 Claims**



1. A voice logging recorder comprising

a logging deck including means for recording voice data onto magnetic recording tape passing therethrough,

a recall tape deck including means for recording or playing said voice data while recording on the other deck to enable on-line recall of voice data without interruption of the recording of voice data onto the tape of the logging deck,

means enabling intermittent actuation of the decks in response to an input signal associated with the beginning of a message containing the voice data to log the voice data onto tape of each deck,

means for recording on the tape of the recall deck a predetermined signal pulse upon the actuation of the decks in response to a said input signal, and

means for sensing each recorded signal pulse to locate the beginning of each recorded message during fast rewind of the tape in the recall deck.

4,012,785

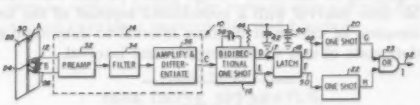
MAGNETIC RECORDING PLAYBACK CIRCUIT

David L. MacDougall, Jr., San Jose, Calif., assignor to Shugart Associates, Inc., Sunnyvale, Calif.

Filed Feb. 13, 1976, Ser. No. 657,714

Int. Cl.² G11B *5/00*

U.S. Cl. 360—43 **10 Claims**



1. A playback circuit for use with a magnetic recording transducer in a magnetic recording apparatus, said transducer developing an alternating current readback signal having alternating positive and negative peaks, said playback circuit comprising:

first means responsive to said readback signal and operative to produce a differentiated signal having first and second polarities and having zero crossings at each transition between said first and second polarities in time coincidence with said positive and negative peaks;

second means responsive to said differentiated signal and operative to produce a first signal having a first level

when said differentiated signal has said first polarity, a second level when said differentiated signal has said second polarity and transitions in time coincidence with said zero crossings, said second means being further operative to produce a second signal comprising a sequence of pulses having leading edges that correspond in time to said zero crossings and having trailing edges that lag said leading edges by a predetermined time interval; and

third means responsive to said first and second signals and operative to produce a third signal having transitions that correspond in time to said trailing edges and having a level that corresponds to the level of said first signal at such time, said transitions of said third signal corresponding to the positive and negative peaks of said readback signal, and lagging such peaks by said predetermined time interval.

4,012,786

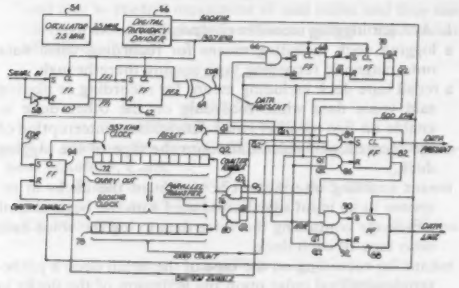
MAGNETIC DATA DECODER

Kenneth Thomas McKie, Rolling Hills Estates, and Istvan Steve Olah, Los Angeles, both of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed Feb. 5, 1976, Ser. No. 655,438

Int. Cl.[2] G11B *5/02*

U.S. Cl. 360—45 **17 Claims**



1. Apparatus for decoding digital information read from a magnetic medium in the form of a series of voltage pulses representing magnetic flux changes on said magnetic medium and in which the time incidence of the voltage pulses of a succeeding bit time interval are compared with a preselected amount of the measured time duration of the prior bit time interval to determine the data state of the succeeding bit time interval comprising:

means for receiving the voltage pulses of said prior bit time interval for determining the beginning and end of said prior bit time interval and for measuring the time duration thereof; and

comparison means for receiving the voltage pulses of said succeeding bit time interval and for comparing the time incidence of said time voltage pulses of said succeeding bit time interval with a preselected amount of the time duration of said prior bit time interval to determine the data state of said succeeding bit time interval.

4,012,787

VIDEO TAPE RECORDER

Nanno Van Slageren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,925

Claims priority, application Netherlands, Jan. 22, 1975, 7500730

Int. Cl.[2] G11B *5/08, 23/10*

U.S. Cl. 360—85 **25 Claims**

1. In a magnetic tape wide-band recording apparatus comprising:

a frame,

a head disc mounted for rotation about an axis, the disc comprising a number of magnetic heads spaced at equal radial distances from the axis of rotation and uniformly spaced around the circumference of the disc,

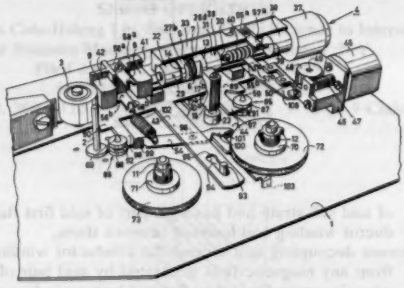
means for supporting the rotatable head disc,

means for rotating the disc,

a tape guide device comprising concavely curved guide members for guiding the tape in a locally transversely curved condition past a part of the circular path of said electromagnetic heads in a direction transverse to the plane of rotation of the head disc, said members having tape guiding surfaces having a radius of curvature,

means for guiding and moving the tape from a supply means to a take-up means, and

actuating means for moving the head disc and the concave guide members relative to each other in a direction transverse to the axis of rotation of the head disc between a disengaged position, in which the concave guide members are disposed at a distance from the head disc sufficient to



allow the magnetic tape to assume a substantially flat shape, and an operating position, in which the magnetic tape is guided past the circular path of the heads in said locally curved condition, the improvement wherein:

the tape guide device further comprises convexly curved guide members disposed on opposite axial sides of the head disc and having tape guiding surfaces having a radius of curvature substantially equal to that of the concave guide members, an axial distance between the convex guide members being greater than the axial distance between the concave guide members, and the concave guide members and convex guide members being movable relative to each other in a direction transverse to the axis of rotation of the head disc, and

the concave guide members each form a part of a pressure piece which, in the operating position, presses the locally transversely curved part of the magnetic tape against the convex guide members.

4,012,788

YIELDABLE, COAXIALLY-DRIVEN TAPE WRAPPING GUIDES FOR USE IN A HELICAL TAPE RECORDER

Douglass L. Blanding, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,994

Int. Cl.[2] G11B *15/66, 23/04*

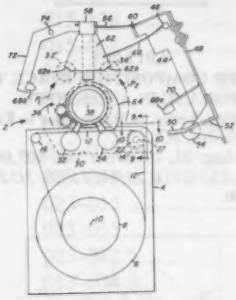
U.S. Cl. 360—85 **7 Claims**

1. For use with a helical scan tape recorder and with a cassette of the type wherein magnetic tape is withdrawn from the cassette and directed around a recording drum which supports at least one recording head that helically scans the tape, the cassette having a window across or through which the tape is adapted to extend or be withdrawn, apparatus for withdrawing the tape from the cassette and helically wrapping it around the recording drum, comprising:

a first gear mounted for rotation about an axis from a first position to a second position;

a second gear mounted on a common axis with respect to said first gear for rotation from a third position to a fourth position, said second gear disposed to rotate counter to the rotation of said first gear;

a first tape threading guide post mounted on said first gear and a second tape threading guide post mounted on said second gear, said posts having tape guiding surfaces for directing the tape around the drum and across the path of the recording head, said first and third positions being positioned relative to the recording drum for locating said posts within the cassette when the cassette is emplaced on the recorder, said second and fourth positions being positioned relative to the recording drum for locating said posts alongside the drum for helically guiding the tape around the drum;



gear drive means for rotating said first gear from said first position to said second position and said second gear from said third position to said fourth position so that, when the cassette is emplaced on the recorder, said posts will engage the tape in said first and third positions and withdraw the tape through the window until said gears reach said second and fourth positions, thereby helically wrapping the tape around the recording drum;

means for biasing said first and second tape threading guide posts for maintaining said posts at predetermined locations on said first and second gears, respectively; and

means for counter rotating said tape threading guide posts, against said bias and relative to the rotation of said gears, for positioning said posts independent of said second and fourth positions of said first and second gears, respectively.

4,012,789

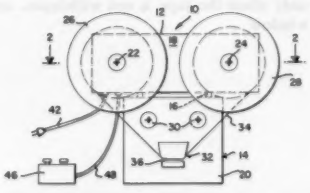
10½ INCH TAPE REEL ADAPTOR

Victor Leshkowitz, 6 Airway Drive, Bellmore, N.Y. 11710

Filed July 24, 1975, Ser. No. 598,631

Int. Cl.² G11B *15/26*

U.S. Cl. 360—90 **5 Claims**



1. An adapter apparatus for 10½ inch diameter recording tape reels for use with a separate tape player having a playing head and a pair of capstans comprising a housing adapted to abut said separate tape player, a pair of capstans carried by said housing spaced apart on at least 10½ inch centers, said adapter capstans being positionable with respect to said playing head for projecting tape through said head without interferring with the capstans of said tape player.

4,012,790

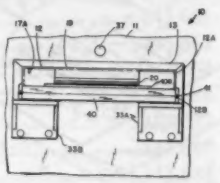
MAGNETIC TRANSDUCING APPARATUS FOR USING BOTH ENDLESS LOOP CARTRIDGES AND REEL-TO-REEL CASSETTES

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Nov. 14, 1974, Ser. No. 523,863

Int. Cl.² G11B *23/04, 25/06, 15/00*

U.S. Cl. 360—94 **8 Claims**



1. An apparatus for reproducing signals recorded on magnetic tape disposed in containers of at least two different sizes comprising in combination:

a support including a housing having an outer wall with first and second openings therein for respectively receiving and permitting tape containing cartridges of different configurations to be inserted into said housing for the playback of signals recorded on the tapes of said cartridges, wherein one of said cartridges contains supply and take-up reel means for the tape thereof with said take-up reel means adapted to be driven to take up the tape during the reproduction of recordings therefrom,

first guide means aligned with a first of said openings in said housing for receiving and guiding said first tape cartridge in a predetermined path into said housing,

first transducing means and first drive means aligned with said first means for engaging the tape of said first cartridge and means for driving said tape through said cartridge,

second guide means aligned with a second of said openings in said wall of said housing for receiving and guiding a cartridge of a second configuration containing an endless tape into said housing,

a second transducing means and a second drive means aligned with said second guide means for engaging and driving the tape through said second cartridge when said second cartridge is inserted into said opening in said housing, and

an electric motor supported within said housing and operatively connected to power operate both said first and second drive means whereby a single source of power may be utilized to drive the tapes of either of said first or second cartridges inserted into said housing.

4,012,791

DISK DRIVE APPARATUS

Lewis William Bleiman, Northridge, Calif., assignor to Pertec Computer Corporation, Chatsworth, Calif.

Filed Oct. 24, 1974, Ser. No. 517,542

Int. Cl.² G11B *3/10, 5/56, 25/04*

U.S. Cl. 360—99 **9 Claims**

1. Disk drive apparatus comprising:

a chassis;

motor means mounted on said chassis, including a spindle for holding a data disk at a predetermined data disk position and rotating it;

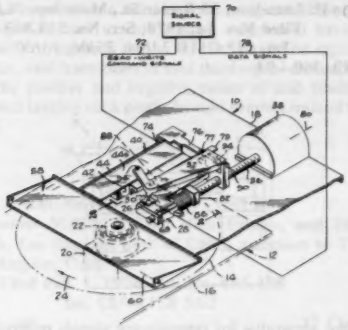
a carriage drive including a drive motor mounted on said chassis and a lead screw coupled to said motor;

a head carriage threadably engaged with said screw;

a data transfer head mounted on said head carriage at a location spaced from the axis of said screw;

a second carriage threadably engaged with said lead screw independently of said head carriage;

means for pivoting said head carriage about said lead screw by a fraction of a turn, including spring means for urging the head carriage to pivot in a first direction to move said head against said data disk position, and selectively actu-



able electrical means for opposing said spring means to pivot said head carriage in a second direction to move the head away from the disk position;

said spring means coupling said head and second carriages for urging them to rotate in opposite directions; and

means for preventing rotation of said second carriage beyond a predetermined position under the force of said spring means.

4,012,792

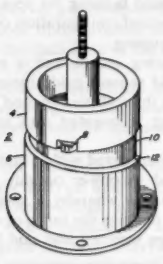
MAGNETIC HEAD DRUM CONFIGURATION HAVING A FRICTION REDUCING HELICAL STEP

Richard M. Bloom, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,557

Int. Cl.² G11B *15/64, 5/60;* **B65H** *17/32*

U.S. Cl. 360—130 **9 Claims**



1. An assembly for use in scanning a magnetic tape comprising:

a first drum section having attached thereto at least one magnetic head and being journaled for rotation about an axis to define trajectory for said head(s), said first drum section having a predetermined diameter about said axis;

a second drum section which is adjacent to and coaxial with the first drum section and includes means for maintaining such section fixed relative to said axis; and

means for directing such a tape along a preselected tape wrap path which extends over said first and second drum sections, said path extending over at least a portion of the trajectory of said head(s),

said second drum section having a reduced diameter relative to said first drum section along that portion of the preselected tape wrap path which extends over such second drum section.

4,012,793

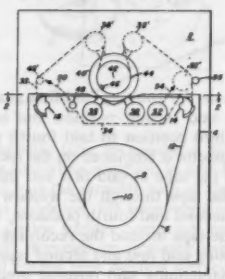
MULTIORIENTED COMPOSITE-SURFACE TAPE GUIDE FOR USE IN A CASSETTE

Douglass L. Blanding, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1975, Ser. No. 607,002

Int. Cl.² G11B *23/04, 15/66, 5/52*

U.S. Cl. 360—130 **9 Claims**



1. For use in a tape cassette of the type having first and second rotatable reels, the cassette being useful with a helical scan recorder, the cassette having a window out of which tape may be withdrawn and helically wrapped around a recording drum, the cassette further having at least one guide post disposed in the path of travel of the tape as it passes from one of the reels to the other, the improvement wherein the post comprises:

first and second contiguous guiding surfaces, said first surface being part of a cylinder and said second surface being part of a cone, said post being so oriented that the tape rides in guiding contact with said cylindrical part whether or not the tape is withdrawn out of the cassette window, and said second surface being so oriented on the post that the tape rides in guiding contact with said conical part only when the tape is not withdrawn out of the cassette window.

DESIGN PATENTS

GRANTED MARCH 15, 1977

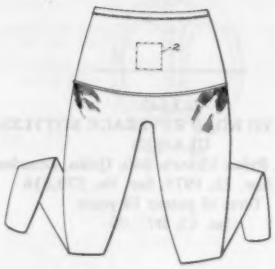
ERRATA

For CLASS	See PATENT NO.
006–141	243,658
008–319	243,661
008–350	243,662
015–138	243,664
015–068	243,686
016–065	243,687
019–088	243,688
022–027	243,689
023–018	243,690
023–055	243,691
023–055	243,692
023–055	243,693
023–072	243,694
013–024	243,698
013–031	243,699
014–040	243,700
027–042	243,702
064–011 B	243,701
024–029	243,705
015–029	243,708
015–005	243,714
024–049	243,715
028–050	243,719
028–051	243,720

DESIGNS

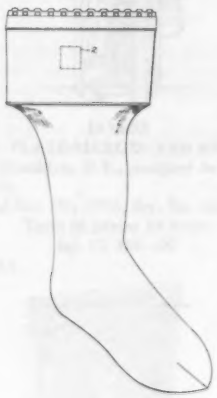
MARCH 15, 1977

243,641
PANTYHOSE
Teresita Alvarez, New York, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Feb. 7, 1975, Ser. No. 548,168
Term of patent 14 years
Int. Cl. D02—*04*
U.S. Cl. D2—6



243,642
REMOVABLE INSOLE CUSHION
John L. Voorhees, 13053 N. 33 Place, Phoenix, Ariz. 85029
Filed June 13, 1974, Ser. No. 479,114
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—318

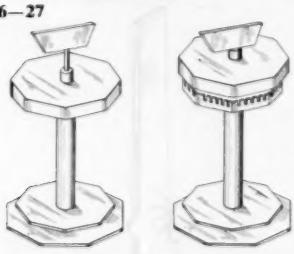
243,643
STOCKING
Teresita Alvarez, New York, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Feb. 7, 1975, Ser. No. 548,169
Term of patent 14 years
Int. Cl. D02—*04*
U.S. Cl. D2—337



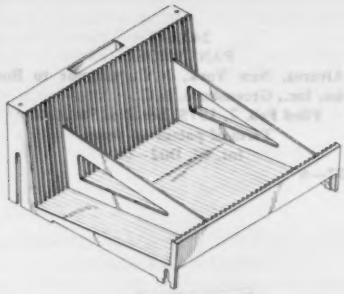
243,644
NECKTIE
Charles Mack Brown, 625 Sawyer St., San Francisco, Calif. 94134
Filed Apr. 2, 1975, Ser. No. 564,264
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—351

243,645
RUG CAROUSEL
John A. Slack, Dalton, Ga., assignor to World Carpets, Dalton, Ga.
Filed Apr. 22, 1975, Ser. No. 570,361
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—25

243,646
DISPLAY STAND FOR NECKLACES OR THE LIKE
George W. Nolan, Seekonk, Mass., assignor to Richton International Corporation
Filed Mar. 29, 1976, Ser. No. 671,508
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—27

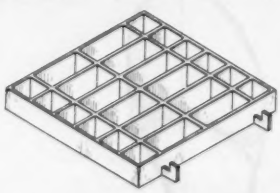


243,647
MERCHANDISE DISPLAY MODULE
Alexander N. Schoenfeld, Roslyn Heights, N.Y., assignor to Trans-World Display Corporation, New York, N.Y.
Filed Aug. 21, 1975, Ser. No. 606,685
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—188

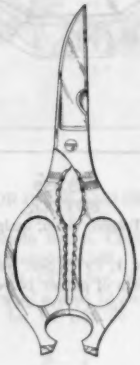


243,648
CONTAINER TO HOLD BEVERAGE BOTTLES AND GLASSES
Federico Conroy, Reina Victoria 860, Quito, Ecuador
Filed Apr. 23, 1975, Ser. No. 570,816
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—71

243,649
COOKING RACK FOR USE IN MICROWAVE OVENS OR THE LIKE
Lloyd H. Carbary, 27635 Edward, Roseville, Mich. 48066
Filed July 3, 1975, Ser. No. 592,825
Term of patent 14 years
Int. Cl. D7—*02*; D6—*04*
U.S. Cl. D7—129

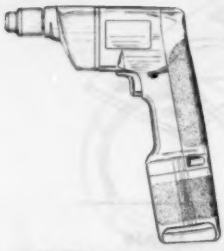


243,650
KITCHEN SCISSORS
Toru Hayashi, Seki, Japan, assignor to Hayashi Cutlery Co., Ltd., Seki, Japan
Filed Feb. 26, 1975, Ser. No. 553,319
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—55



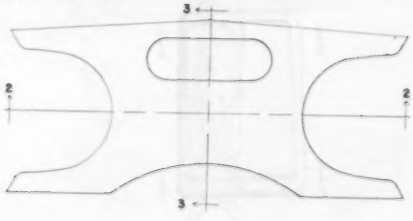
243,651
DRESSMAKER'S SHEARS
Toru Hayashi, Seki, Japan, assignor to Hayashi Cutlery Co., Ltd., Seki, Japan
Filed Feb. 26, 1975, Ser. No. 553,237
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

243,652
CORDLESS ELECTRIC TOOL
Donald William Zurwelle, Lutherville; Lee Webber Ramstrom, Kingsville, and Stanley Alan Markle, Lutherville, all of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.
Filed July 31, 1975, Ser. No. 600,262
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. 8—68

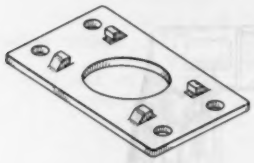


243,653
WALL PLATE-MARGIN AND FILIGREE
Leonard Fine, Brooklyn, N.Y., assignor to General Electric Company, N.Y.
Filed Oct. 20, 1975, Ser. No. 624,086
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—353

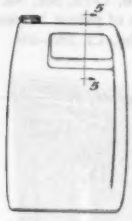
243,654
PORTABLE CORD HOLDER
Thomas J. Burgoyne, 143 Canal St., Brattleboro, Vt. 05301
Filed May 11, 1976, Ser. No. 685,311
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—358



243,655
ADAPTOR PLATE
Stephen Matousek, Chagrin Falls, and Ulrich H. Koch, Bainbridge Township, both of Ohio, assignors to Whitey Research Tool Co.
Filed May 19, 1975, Ser. No. 578,757
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

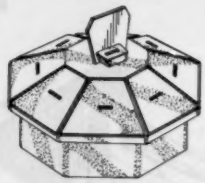


243,656
BOTTLE OR SIMILAR ARTICLE
Wayne Robert Hutter, and John Andrew Miller, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Aug. 29, 1975, Ser. No. 608,862
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—53

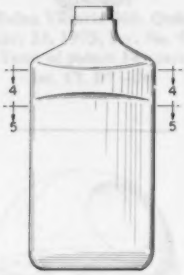


243,657
BOTTLE
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Oct. 1, 1975, Ser. No. 618,296
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—129

243,658
DISPLAY STAND FOR RINGS
David Schneider, 31 Vista del Golfo, Long Beach, Calif. 90803
Filed Mar. 17, 1976, Ser. No. 667,647
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—141



243,659
BOTTLE
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Oct. 1, 1975, Ser. No. 618,310
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167

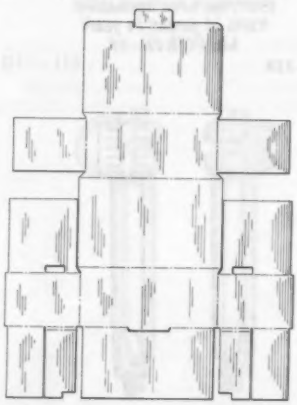


243,660
BOTTLE
Ira Howard Levy, New York, N.Y., assignor to Estee Lauder, Inc, New York, N.Y.
Filed Nov. 14, 1975, Ser. No. 632,022
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

243,661
PULL
Hubert Dolnar, Pierrefonds, Canada, assignor to Unican Security Systems, Ltd., Quebec, Canada
Filed Feb. 25, 1976, Ser. No. 661,173
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—319

243,662
BACKING PLATE FOR DOOR AND DRAWER PULLS AND THE LIKE
David F. James, Redondo Beach, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.
Filed Mar. 29, 1976, Ser. No. 671,125
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350

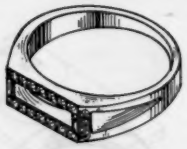
243,663
BOX BLANK
Vernard S. Booth, Albany, Ga., assignor to Olinkraft, Inc., West Monroe, La.
Filed Oct. 8, 1975, Ser. No. 620,901
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



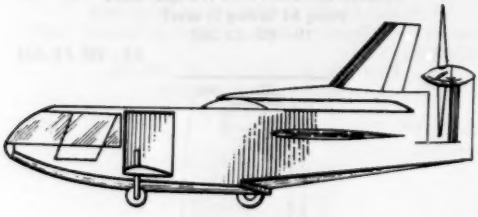
243,664
INDEX RING FOR A MACHINE TOOL
Garnet R. Lyon, Elmira, N.Y., assignor to Hardinge Brothers, Inc.
Filed Nov. 10, 1975, Ser. No. 630,622
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—138

243,665
COMBINED WRISTWATCH AND BRACELET
Frederic Laurent, Montmollin, Switzerland, assignor to Timex Corporation, Waterbury, Conn.
Filed Oct. 29, 1975, Ser. No. 626,804
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—12

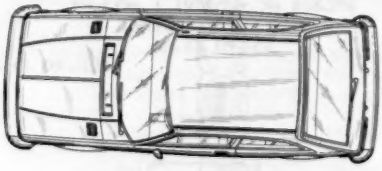
243,666
RING
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Oct. 6, 1975, Ser. No. 620,066
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

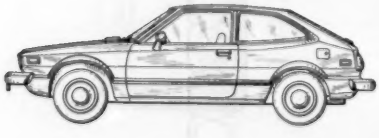


243,667
AIRPLANE
Kenneth L. Bunyard, 45 Olive Drive, Hialeah, Fla. 33010
Filed Dec. 29, 1975, Ser. No. 644,760
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78

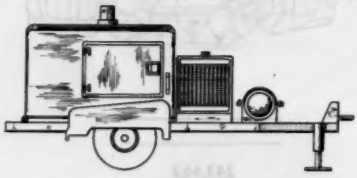


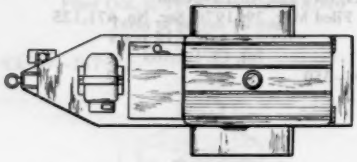
243,668
AUTOMOBILE
Katsusuke Komuro, Chofu, and Shinya Iwakura, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 22, 1975, Ser. No. 643,841
Claims priority, application Japan, June 30, 1975, 50-27521
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



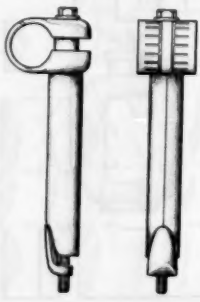


243,669
MOBILE WELDING MACHINE
William Lee Webster, 2249 Yorkshire, Decatur, Ill. 62526
Filed Aug. 1, 1975, Ser. No. 601,221
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—101

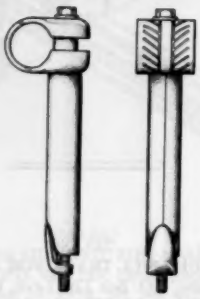




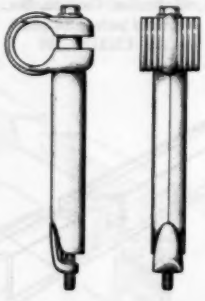
243,670
BICYCLE STEERING POST
Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated
Filed Aug. 13, 1971, Ser. No. 171,789
The portion of the term of this patent subsequent to July 3, 1987, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—118



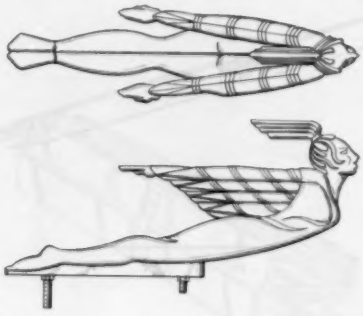
243,671
BICYCLE STEERING POST
Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated
Filed Aug. 13, 1971, Ser. No. 171,791
The portion of the term of this patent subsequent to July 25, 1986, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—118



243,672
BICYCLE STEERING POST
Carlton P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated
Filed Aug. 13, 1971, Ser. No. 171,793
The portion of the term of this patent subsequent to July 25, 1986, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—118

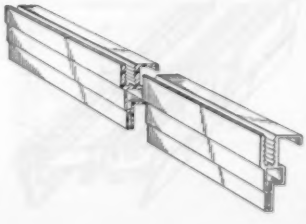


243,673
HOOD ORNAMENT
Norvel P. West, 7022 S. Shore Drive, Chicago, Ill. 60649
Filed Dec. 31, 1975, Ser. No. 645,711
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—200

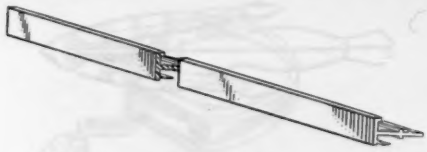


243,674
EXTRUDED SIDE RAIL FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,768
Claims priority, application Canada, Dec. 28, 1973, 45528
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76

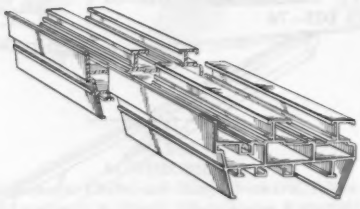
243,675
EXTRUDED SIDE RAIL FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,769
Claims priority, application Canada, Dec. 28, 1973, 45527
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76



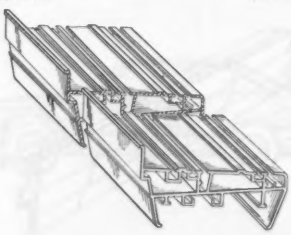
243,676
EXTRUDED SILL TRACK INSERT FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,770
Claims priority, application Canada, Dec. 28, 1973, 45526
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



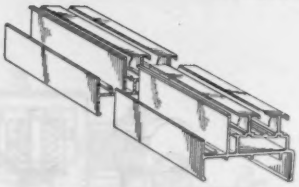
243,677
EXTRUDED SILL TRACK FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,771
Claims priority, application Canada, Dec. 28, 1973, 45523
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



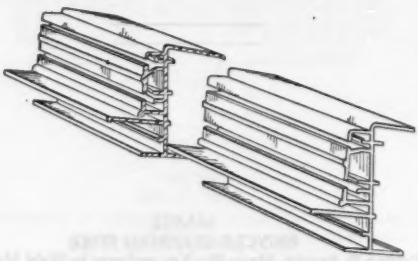
243,678
EXTRUDED SILL TRACK FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,772
Claims priority, application Canada, Dec. 28, 1973, 45517
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



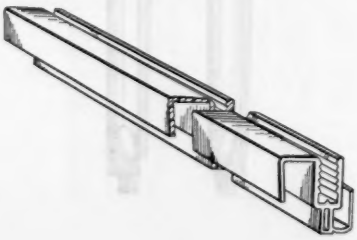
243,679
EXTRUDED SILL TRACK FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,773
Claims priority, application Canada, Dec. 28, 1973, 45525
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



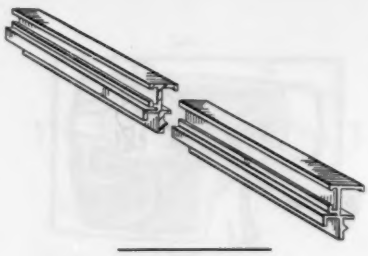
243,680
EXTRUDED SILL TRACK FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,774
Claims priority, application Canada, Dec. 28, 1973, 45524
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



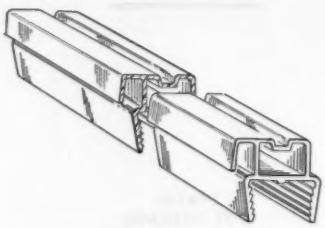
243,681
EXTRUDED SIDE RAIL FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,775
Claims priority, application Canada, Dec. 28, 1973, 45529
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76



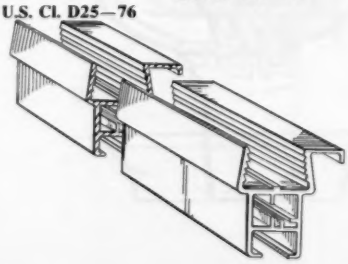
243,682
EXTRUDED SILL TRACK INSERT FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,777
Claims priority, application Canada, Dec. 28, 1973, 45522
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



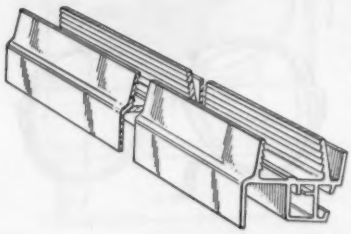
243,683
EXTRUDED SIDE RAIL FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,778
Claims priority, application Canada, Dec. 28, 1973, 45520
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76



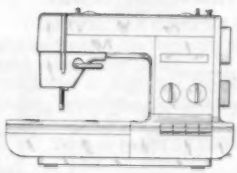
243,684
EXTRUDED SIDE RAIL FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,779
Claims priority, application Canada, Dec. 28, 1973, 45521
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76

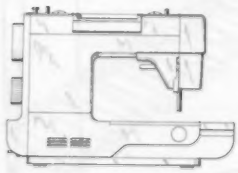


243,685
EXTRUDED SIDE RAIL FOR A WINDOW
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed June 24, 1974, Ser. No. 482,780
Claims priority, application Canada, Dec. 28, 1973, 45519
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76

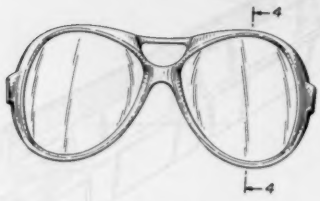


243,686
SEWING MACHINE
Kazuo Ito, Seiwa-Ryo, 37 Hakuryu-cho, 1-chome, Mizuho, Nagoya, Aichi, Japan
Filed June 19, 1975, Ser. No. 588,616
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—68

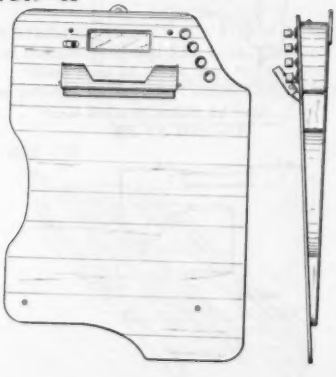




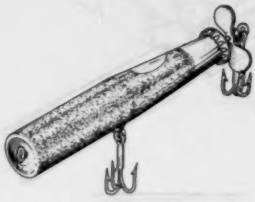
243,687
PAIR OF SPECTACLES
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Dec. 8, 1975, Ser. No. 638,488
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



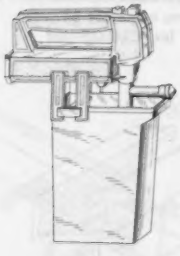
243,688
COMBINED CLIPBOARD AND TIMER
George Keyko, Westfield, N.J., and Robert H. Esslinger, Wilton, Conn., assignors to Quartz Timing Corporation, Long Island City, N.Y.
Filed June 30, 1975, Ser. No. 588,439
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—88



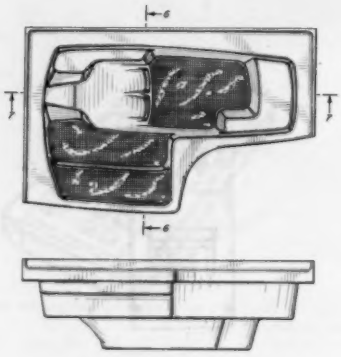
243,689
BOTTLE-SHAPED FISHING LURE
Benjamin W. Price, P.O. Drawer 16875, Jacksonville, Fla. 32216
Filed Mar. 15, 1976, Ser. No. 666,922
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



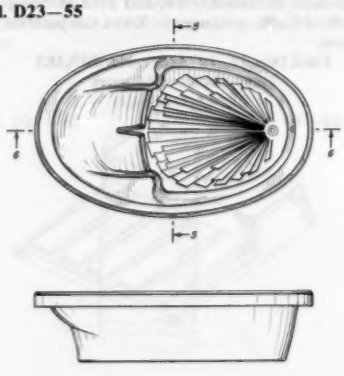
243,690
BATTERY-POWERED PUMP
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Aug. 22, 1975, Ser. No. 606,776
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



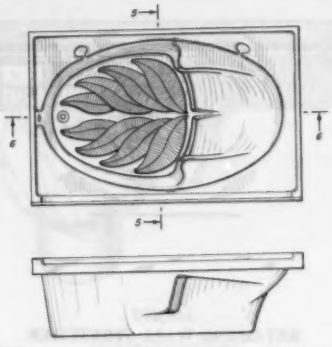
243,691
BATHING POOL
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.
Filed May 28, 1976, Ser. No. 690,987
Term of patent 14 years
Int. Cl. D23—02
U.S. Cl. D23—55



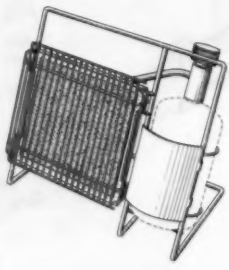
243,692
SOAKING TUB
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.
Filed May 28, 1976, Ser. No. 690,988
Term of patent 14 years
Int. Cl. D23—02
U.S. Cl. D23—55



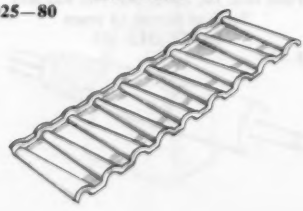
243,693
BATH TUB
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.
Filed May 28, 1976, Ser. No. 691,036
Term of patent 14 years
Int. Cl. D23—02
U.S. Cl. D23—55



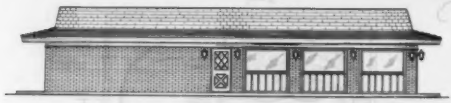
243,694
PORTABLE CATALYTIC HEATER
Ernest L. Faulkner, Independence, Kans., assignor to Bruest Industries, Inc., Independence, Kans.
Filed July 16, 1975, Ser. No. 596,278
U.S. Cl. D23—72



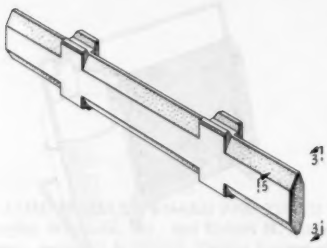
243,695
METAL ROOFING TILE
Andries Stephanus Roux, 7, Da Gama St., Eastleigh, Edenvale, Transvaal Province, South Africa
Filed May 2, 1975, Ser. No. 574,091
Claims priority, application South Africa, Dec. 30, 1974, 74/1238
Term of patent 14 years
Int. Cl. D25—01
U.S. Cl. D25—80



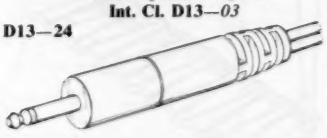
243,696
BUILDING
Jack R. Butz, Tulsa, Okla., assignor to Ken's Pizza Parlors, Inc.
Filed Mar. 27, 1975, Ser. No. 562,557
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25



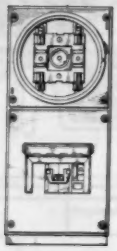
243,697
RETAINING WALL STRETCHER
William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Co., Eureka, Calif.
Filed May 2, 1975, Ser. No. 573,975
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77



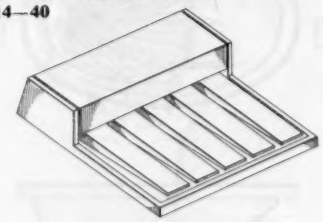
243,698
COMBINED ELECTRICAL CONNECTOR AND ADAPTER PLUG THEREFOR
James J. Gietzen, 75 Parnell Drive, Smithtown, N.Y. 11787
Filed Oct. 16, 1975, Ser. No. 622,831
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



243,699
COMBINED POWER OUTLET AND METER SUPPORT BOX
Merle A. Plummer, North Hollywood, Calif., assignor to Myers Electric Products, Inc., Montebello, Calif.
Filed July 18, 1975, Ser. No. 597,307
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—31

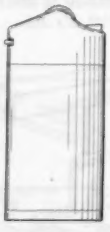


243,700
KEY SET DEVICE FOR ENCODING DATA
Carl J. Clement, Mountain View, and Fred H. Stengel, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 16, 1974, Ser. No. 533,353
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



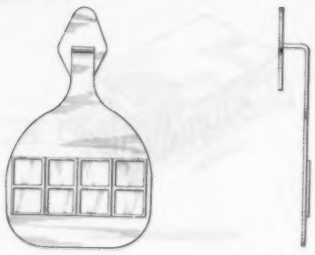
243,701
ELECTRONIC CALCULATING MACHINE
Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki Kaisha
Filed July 30, 1975, Ser. No. 600,441
Claims priority, application Japan, Jan. 31, 1975, 50-4385
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—118

243,702
BUTANE DISPOSABLE LIGHTER
Robert P. Sherman, 1200 Park Ave., Murfreesboro, Tenn. 37130
Filed May 28, 1974, Ser. No. 473,411
Term of patent 14 years
Int. Cl.[2] D27—*05*
U.S. Cl. D27—42



243,703
AQUARIUM
Tyrone Gamble, 771 Catona Park North, New York, N.Y. 10561
Filed Apr. 28, 1976, Ser. No. 681,340
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—8

243,704
EAR TAG
Antonio M. Cavazos, 22406 Greenbrook, Houston, Tex. 77090
Filed Dec. 23, 1974, Ser. No. 535,300
Term of patent 3½ years
Int. Cl. D30—*08*
U.S. Cl. D30—43



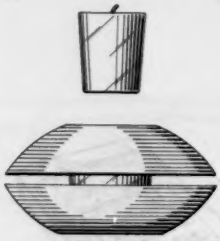
243,705
TISSUE CULTURE FLASK
George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation
Filed Apr. 1, 1976, Ser. No. 672,763
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—29

243,706
GOLF CLUB HEAD
Marshall D. Hall, 2075 Hammock Place, Sarasota, Fla. 33580
Filed May 29, 1975, Ser. No. 581,815
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

243,707
SIMULATED TABLE TOP STAGE FOR PERFORMING MAGIC TRICKS OR THE LIKE
Robert L. Brass, 4 Norwood Lane, Westport, Conn. 06880
Filed Nov. 21, 1975, Ser. No. 634,127
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

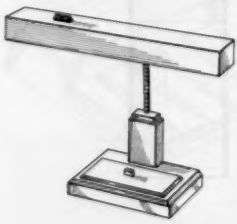
243,708
CULTIVATOR TINE
Cornelis van der Lely, 7, Bruschenrain, ZUG, Switzerland, and Ary van der Lely, 10, Weverskade, Maasland, Netherlands
Filed Sept. 22, 1975, Ser. No. 615,678
Claims priority, application Belgium, Mar. 20, 1975, 5016901
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

243,709
COMBINED CANDLE AND HOLDER THEREFOR
Richard C. Moore, 527 SW. Pamona, Portland, Oreg. 97219
Filed July 16, 1975, Ser. No. 596,280
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



243,710
LAMP
Frank Angeles, Hacienda de Xalpa 7,, Bosque de Echegaray Edo. de Mexico, Mexico
Filed Jan. 5, 1976, Ser. No. 647,257
Term of patent 14 years
Int. Cl. D26—*05*; D21—*01*
U.S. Cl. D48—20 B

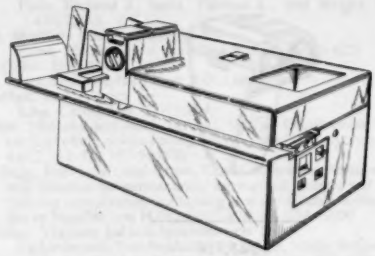
243,711
LAMP
Howard S. Haft, Chicago, Ill., assignor to Art Specialty Company
Filed Oct. 3, 1975, Ser. No. 619,221
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F



243,712
AUTOMATIC MAILING MACHINE FOR MOISTENING, SEALING AND STAMPING ENVELOPES

John Charles Morris; Elmer J. Stoltz, both of Castro Valley, and Richard A. Nyquist, Menlo Park, all of Calif., assignors to The Singer Company

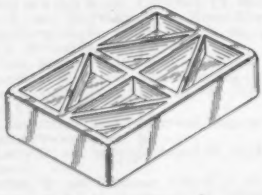
Filed Nov. 8, 1974, Ser. No. 528,196
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D64—11 R



243,713
SOAP BAR

David Jon Morrison, 1402 S. 78th St., Omaha, Nebr. 68127

Filed Sept. 2, 1975, Ser. No. 609,408
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D73—1 A



243,714
TRANSMISSION FLUID TRANSFER AND COVER PLATE FOR MOTORCYCLE ENGINES

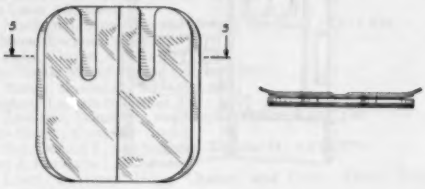
Gilbert W. Younger, 2627 Merced Ave., El Monte, Calif. 91733

Filed Mar. 3, 1975, Ser. No. 554,672
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—5

243,715
RETAINING AND PROTECTIVE DEVICE FOR INTRAVENOUS INFUSION MEANS

Edward J. Trimnell, Cincinnati, Ohio, assignor to Litton Business Systems, Inc.

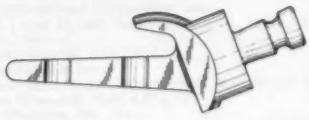
Filed May 6, 1975, Ser. No. 575,006
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 R



243,716
GREAT TOE PROSTHESIS

Daniel H. Treace, Germantown, Tenn.; Lowell S. Weil, Des Plaines, and Stephen D. Smith, Chicago, both of Ill., assignors to Richards Manufacturing Company, Memphis, Tenn.

Filed July 24, 1975, Ser. No. 598,649
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 E



243,717
PHYSIOLOGICAL MONITORING DEVICE HOUSING

K. William Edmark, Seattle; David B. Smith, Mercer Island, and Louis D. Pheil, Redmond, all of Wash., assignors to Physio Control Corporation, Redmond, Wash.

Filed Aug. 18, 1975, Ser. No. 605,440
Term of patent 14 years
Int. Cl. D24—*02*; D10—*99*
U.S. Cl. D83—1 F

243,718

ILLUMINATED CONTACT LENS KIT

J. Robert Bren, 1429 N. Hayworth Ave., Apt. A, Los Angeles, Calif. 90046

Filed June 30, 1975, Ser. No. 591,901
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—9

243,719

DRY SHAVER OR SIMILAR ARTICLE

Klaas Tiemen Oord, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1975, Ser. No. 573,473
Claims priority, application Switzerland, Nov. 6, 1974, 59771/74
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—50

243,720

ELECTRIC SHAVER

Yozo Yajima, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Japan

Filed June 19, 1975, Ser. No. 588,196
Claims priority, application Japan, Dec. 19, 1974, 49-44566
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—51

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Adams, Sally Lee; Martin, Fred David; and Cook, Michael M., to Calgon Corporation. Method of using cementing composition having improved flow properties. 4,011,909, Cl. 166-293.000.

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Anderson, Warren A.: *See*—
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Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical film rewinding device. 4,012,755, Cl. 354-214.000.
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Becker, James H.; and Wysocki, Joseph J., to Xerox Corporation. Texture transformations in optically negative liquid crystals. 4,012,118, Cl. 350-160.0LC.

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Jerrold-Jones, Paul; and Krull, Irwin H., 4,012,308.
Pederson, Victor V.; and Wright, Herschel E., 4,011,972.

Beecham Group Limited: *See*—
Doyle, Frank Peter; Cantello, Barrie Christian Charles; Buckle, Derek Richard; and Smith, Harry, 4,012,407.

Behrens, Rudolf Adolf, to American Cyanamid Company. Rubber vulcanization accelerator composition. 4,012,332, Cl. 252-182.000.

Bell & Howell Company: *See*—
Sample, Winfield; and Cheney, Robert L., 4,012,694.

Bell Industries, Inc.: *See*—
Biddle, Christopher Scott, 4,012,105.

Bell, Robert, to Lawrence Peska Associates, Inc., a part interest. Adjustable floatation belt. 4,011,614, Cl. 9-337.000.

Bell Telephone Laboratories, Incorporated: *See*—
Bonyhard, Peter Istvan; and Smith, James Lanson, 4,012,726.
Gersho, Allen, 4,012,628.
Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, 4,012,699.
Hinrichsen, Robert Alfred; and Plewes, John Travis, 4,012,240.
Klein, Theodore Harold, 4,012,267.
Wiley, Paul Ronald, 4,012,598.

Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., to Bristol-Myers Company. $\Delta^{2,3}$-1,4-morpholine-2-carboxylic acids and derivatives thereof useful in preparation of antibacteria agents. 4,012,383, Cl. 260-244.00R.

Bendtsen, Randall R., to Caterpillar Tractor Co. Folding ejector linkage for material handling machinery. 4,011,957, Cl. 214-82.000.

Bengtsson, Sigurd Walter. Hinge means for a pivotable window. 4,011,628, Cl. 16-140.000.

Bentley, Clarence. Flow control valve. 4,011,893, Cl. 138-43.000.

Berenbaum, Morris B.: *See*—
Nychka, Henry R.; Berenbaum, Morris B.; Robinson, Martin A.; and Eibeck, Richard E., 4,012,453.

Berg, Gudbrand Gunnarson. Apparatus for cutting an elongate member of arbitrary length into shorter sections of predetermined lengths. 4,011,779, Cl. 83-71.000.

Berkowitz, Murray; and Woodier, George H., to Curtiss-Wright Corporation. Rotary compressor with labyrinth sealing. 4,012,180, Cl. 418-141.000.

Bernardi, Giancarlo: *See*—
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Berry, Homer E., to Superior Concrete Accessories, Inc. Key-joint forming divider strip and screed for use with concrete slabs. 4,012,159, Cl. 404-68.000.

Bertoniere, Noelie R.; Rowland, Stanley P.; and Roberts, Earl J., to United States of America, Agriculture. Durable-press properties in cotton containing fabrics via polymeric N-methylol reagents. 4,011,613, Cl. 8-191.000.

Besprozvanny, Robert Matveevich; Abramson, Iosif Gershevich; Egorov, Georgy Borisovich; Nudelman, Rafail Manusovich; and Nikiforov, Jury Vasilievich. Method of producing mineral binder and apparatus embodying same. 4,012,639, Cl. 250-492.00B.

Besson, Rene, to Ebauches S.A. Capacitive adjusting device for a quartz crystal oscillator. 4,012,700, Cl. 331-116.00R.

Best, James F.: *See*—
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O'Reilly, Bernard M.; and Best, James F., 4,012,075.

Bethlen, Farkas, to G. D. Searle & Co. Hospital trolleys. 4,011,609, Cl. 5-81.00B.

Bettenhausen, Larry A.; Casey, James H.; and Luhman, Robert A., to Minnesota Mining and Manufacturing Company. Tape handling apparatus. 4,011,977, Cl. 226-88.000.

Beutler, Eden E. Distributor assembly for a vehicle. 4,011,851, Cl. 123-146.50A.

Beyer, Eduard: *See*—
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Bianchetta, Donald L.; and Field, Jesse L., Jr., to Caterpillar Tractor Co. Synchronized vehicle fluid drive system. 4,011,920, Cl. 180-6.480.

Bichel, Darwin Carl: *See*—
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Biddle, Christopher Scott, to Bell Industries, Inc. Coaxial electrical connector. 4,012,105, Cl. 339-177.00R.

Bien, John D.: *See*—
Cardenas, Cesar A.; Bien, John D.; and Carangelo, Salvatore, 4,012,358.

Bienert, Walter B.: *See*—
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Birchall, George Richard; Hepworth, Walter; and Smith, Stephen Collyer, to Imperial Chemical Industries Limited. Indole derivatives for providing analgesic and anti-inflammatory effects. 4,012,513, Cl. 424-251.000.

Birdsall, John C.: *See*—
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Bishop, Leonard William Jerome: *See*—
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Black, Bobby E., to PSI Products, Inc. Method for making a pipe coupling. 4,011,652, Cl. 29-455.00R.

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Clark, Donald Lawrence; Fraunfelter, Floyd Samuel, Jr.; and Ruth, Robert Richard, 4,011,782.
Proett, Mark Anton, 4,011,624.

Black, Geoffrey Donald, to Medishield Corporation Limited, The. Respiratory signalling device. 4,011,828, Cl. 116-70.000.

Blackburn, Tom L.; and Wisotzky, Otto G., to GTE Automatic Electric Laboratories Incorporated. Resistive pad with bridging resistor. 4,012,688, Cl. 323-79.000.

Blackwell, Lyman L.: *See*—
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Blaha, Robert F., to Texas Instruments Incorporated. Starting circuit for single phase motor. 4,012,678, Cl. 318-221.00D.

Blanding, Douglass L., to Eastman Kodak Company. Yieldable, coaxially-driven tape wrapping guides for use in a helical tape recorder. 4,012,788, Cl. 360-85.000.

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Blank, Heinz-Ulrich; Wedemeyer, Karlfried; and Ebersberger, Josef, deceased (by Ebersberger, Thea, heiress), to Bayer Aktiengesellschaft. Process for preparing M-chlorobenzene sulphonyl chloride. 4,012,442, Cl. 260-543.00R.

Blasingame, Steve J. Invertible pocketed target for a disc throwing game. 4,012,042, Cl. 273-95.00R.

Bleiman, Lewis William, to Pertec Computer Corporation. Disk drive apparatus. 4,012,791, Cl. 360-99.000.

Blincoe, Homer P., to Electromagnetic Sciences, Inc. Blocking oscillator driver for a microwave latching ferrite device. 4,012,644, Cl. 307-275.000.

Bliss & Laughlin Ind., Inc.: *See*—
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Bloch, Ramon: *See*—
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Bloom, Richard M., to Eastman Kodak Company. Magnetic head drum configuration having a friction reducing helical step. 4,012,792, Cl. 360-130.000.

Bockhold, Lawrence J.: *See*—
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Bode, Robert G., to Custom Accessories, Inc. Splash guard. 4,012,053, Cl. 280-154.50R.

Boeing Company, The: *See*—
Ball, William Henderson; and Ishimitsu, Kichio Keith, 4,012,013.

Bogaty, Herman; and Peleckis, Anthony John, to Warner-Lambert Company. Coated razor blade. 4,012,551, Cl. 428-192.000.

Boici, Vasile, to Intreprinderea de Medicamente Terapia, Romania. Analgesic substance derived from the Helleborus plant and method of making same. 4,012,505, Cl. 424-195.000.

Bolander, Lawanda Charleen. Magnifying attachment for telephone buttons and the like. 4,012,127, Cl. 350-243.000.

Bommaraju, Tilak V.: *See—*
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Bond, Geoffrey Colin, to Johnson Matthey & Co., Limited. Catalytic reactions. 4,012,450, Cl. 260-604.0HF.

Bond, Walter L.; Kompfner, Rudolf; and Lemons, Ross A., to Leland Stanford Junior University, The Board of Trustees of. Method and apparatus for acoustic and optical scanning of an object. 4,011,748, Cl. 73-67.600.

Bonetti, Andrea, to Snam Progetti S.p.A. Integrated urea-ammonia process. 4,012,443, Cl. 260-555.00A.

Bonyhard, Peter Istvan; and Smith, James Lanson, to Bell Telephone Laboratories, Incorporated. Magnetic bubble replicator. 4,012,726, Cl. 340-174.0TF.

Boothe, Jerry Emile; and Martin, Fred David, to Calgon Corporation. Thickened alcohol well treating compositions. 4,012,327, Cl. 252-8.55R.

Bordenave, Joseph Heber; and Falls, Robert, to Cincinnati Butchers' Supply Company, The. Method and means for stabilizing and positioning a trolley hanger relative to a conveyor rail. 4,011,820, Cl. 104-97.000.

Borg-Warner Corporation: *See—*
Calabretta, Peter Trent, 4,012,183.
Gaylord, Norman G., 4,012,575.
Millard, Gregory Stephen Truscott, 4,011,905.

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Bos, Jules; and Von Der Kall, Gunter, to U.S. Philips Corporation. Method of and device for grinding grooves. 4,011,692, Cl. 51-323.000.

Botros, Raouf, to American Color & Chemical Corporation. Bisazomethine dyes for metal-modified polyolefins. 4,012,193, Cl. 8-42.00D.

Bouillie, Remy A.; and Lamouler, Pierre. Measuring method and equipment for locating a break in an optical cable. 4,012,149, Cl. 356-237.000.

Bourne, Edmund Alexander; and Fitzgerald, James Gerard, to National Research Development Corporation. First aid equipment. 4,011,945, Cl. 206-223.000.

Bouteille, Daniel: *See—*
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Bouton, John C.; Partin, Melvin E.; and Hilghman, Robert C., to Geometric Data Corporation. Automatic focusing system including quantizing means. 4,012,634, Cl. 250-201.000.

Bouzard, Daniel; and Weber, Abraham. α-Amino and α-formyl-α-(p-acyloxyphenyl)acetamidocephalosporanic acid derivatives. 4,012,382, Cl. 260-243.00C.

Bowen, Russell H.; Clark, Allen L.; Davis, David C.; Gilbert, Walter E.; Glover, Wayne L.; Walsh, Richard J.; and Wehling, Robert G., to Honeywell Information Systems, Inc. Non-logic printed wiring board test system. 4,012,625, Cl. 235-153.0AC.

Boyd, William A.; and Britt, Richard T. Plant injection method and apparatus. 4,011,685, Cl. 47-57.500.

Boyer, Richard J. Bracket for small animal feeder. 4,011,951, Cl. 211-71.000.

Boys, John T., to Standard Pressed Steel Co. Method and apparatus for counting small parts. 4,012,622, Cl. 235-92.0PK.

Braber, Robert J.; and Weber, Paul L., to Lehigh Press, Inc., The. Package construction for opening only by a predetermined procedure. 4,011,949, Cl. 206-532.000.

Bradbury, John Albert Avery; and Kendall, Matthew Giles, to Imperial Chemical Industries Limited. Fibre masses. 4,011,651, Cl. 29-424.000.

Bradshaw, James E.: *See—*
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Braithwaite, John Colin; and Edwards, John Lawton, to British Gas Corporation. Pipe cleaning apparatus. 4,011,690, Cl. 51-8.00R.

Brandtjen, Sheldon J., to Northwest Engineering Company. Apron attitude adjustment for loading and conveying machines. 4,011,937, Cl. 198-517.000.

Branning, Peter: *See—*
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Brantley, Lott W.; and Lawson, Billy D., to United States of America, National Aeronautics and Space Administration. Mount for continuously orienting a collector dish in a system adapted to perform both diurnal and seasonal solar tracking. 4,011,854, Cl. 126-270.000.

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Braun, Oskar J.; and Rengert, Thomas A., to Xerox Corporation. Oil metering blade loading assembly. 4,011,831, Cl. 118-60.000.

Bredeson, Larry D.; McCullough, Glenn R.; and Wylie, Oran L., to Shell Development Company. Thermal cracking method for the production of ethylene and propylene in a molten metal bath. 4,012,457, Cl. 260-683.00R.

Bresee, Louis B., Jr.; Brownlee, Charles A.; and Leightner, Robert A., to General Electric Company. Gun fire control system. 4,011,789, Cl. 89-41.0EA.

Brewster, Philip W., to Exxon Research & Engineering Co. Lithium salts of hydrocarbon substituted amic acid as low ash rust inhibitors. 4,012,330, Cl. 252-33.600.

Brickerd, Millard S., Jr.; and Hudson, John A., to United States of America, Navy. Portable pulsed signal generator. 4,012,641, Cl. 307-106.000.

Bristol-Myers Company: *See—*
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Britton, James Earl; Grant, Joseph L.; and Welch, John Alan, to General Tire & Rubber Company, The. Method of forming belted radial tires from a cylindrical tire band. 4,012,479, Cl. 264-315.000.

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Brocoff, Jack, to Ralph M. Parsons Company. Process for the treatment of sulfur and nitrogen oxides formed during power generation. 4,012,488, Cl. 423-244.000.

Brodbeck, Eduard; and Forster, Theobald, to SIG Schweizerische Industrie-Gesellschaft. Safety system for firearm. 4,011,678, Cl. 42-70.00F.

Brokke, Mervin E.: *See—*
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Brouard, Claude Marie Henri Emile; and Ficht, Paulette Gisele, to Produits Chimiques Ugine Kuhlmann. Monoazo chromiferous complex dyestuffs derived from naphthyl-azo-naphthalene, and process for their preparation. 4,012,369, Cl. 260-146.00R.

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Brown, Dale M.; Garfinkel, Marvin; and Ghezzo, Mario, to General Electric Company. Electrical interconnections for semi-conductor devices. 4,012,767, Cl. 357-71.000.

Brown, Fred P., Jr., to Packaging Industries, Inc. Bag handling apparatus. 4,011,708, Cl. 53-187.000.

Brown, Fred P., Jr., to Packaging Industries, Inc. Web handling system. 4,011,975, Cl. 226-2.000.

Brown, John, to Qantix Corporation. Sawtooth shaped front screen. 4,012,115, Cl. 350-128.000.

Brown, Michael K.; Lundquist, David E.; Bullis, Leonard P.; and McGregor, Arvin D., to Burroughs Corporation. Phase correction system. 4,012,745, Cl. 346-1.000.

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Brownstein, Arthur M.; Jung, John A.; and Hansen, Robert, to Chem Systems, Inc. Process for the production of epoxides. 4,012,423, Cl. 260-348.00R.

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Brummett, Marshall G.; Heckman, Russell W.; Nickey, George A.; and Taylor, James E., to Owens-Illinois, Inc. Water-cooled support bar. 4,012,271, Cl. 156-423.000.

Brun, Charles Georges Henri; and Tirmarche, Philippe Marcel Rene, to Union Siserurgique du Nord et de l'Est de la France, par abreviation "USINOR". Process for treating steel sheets for the purpose of enamelling the sheets. 4,012,239, Cl. 148-6.300.

Brunet, Maurice: *See—*
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Bruning, Klaus; Sturm, Karl-Gunter; and Hahn, Siegfried, to Dynamit Nobel Aktiengesellschaft. Coating powders on the basis of thermoplastic polyesters. 4,012,363, Cl. 260-75.00R.

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Brunner, Russell K., to Xerox Corporation. Linear actuator. 4,012,779, Cl. 360-78.000.

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Buchler, Wolfram: *See—*
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Burton, Verna M. Topical composition and method. 4,012,508, Cl. 424-235.000.
Buscher, David J., to United States of America, Army. Multi-axis laser scanner. 4,012,143, Cl. 356-71.000.
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Carella, Richard F. Arrow vane. 4,012,043, Cl. 273-106.50C.
Carl Becher oHG Planen-und Zelte-Fabrik: *See—*
Becher, Klaus, 4,011,881.
Carl, Brigitte; and Stourac, Jaroslav, to Dr. Bruno Lange GmbH. Method and reagent for the quantitative analysis of triglycerides. 4,012,287, Cl. 195-103.50R.
Carmine Foods, Inc.: *See—*
Jett, Edgar A., III; and Phillips, Maurice L., 4,011,686.
Carney, William V.: *See—*
DeLuca, Paul V.; and Carney, William V., 4,012,096.
Carrick, Lawrence K., to Calkins Manufacturing Company. Boat trailer. 4,011,958, Cl. 214-84.000.
Carroll, Robert J.; and O'Neil, Walter K., to Eaton Corporation. Low KVA static AC motor drive. 4,012,682, Cl. 321-5.000.
Carson, William S. Loading apparatus. 4,012,069, Cl. 294-70.000.
Carter, Elbert P., to Du Pont de Nemours, E. I., and Company. Driver amplifier for adjustable high voltage power supply. 4,012,687, Cl. 323-22.00V.
Case Western Reserve University: *See—*
Enger, Carl C., 4,011,861.
Casey, James H.: *See—*
Bettenhausen, Larry A.; Casey, James H.; and Luhman, Robert A., 4,011,977.
Castle, William F.: *See—*
Vegh, Elmer S.; Castle, William F.; Hadbavny, Leonard P.; Klier, Donald F.; and Schwerzler, David S., 4,011,805.
Castro, Albert J.: *See—*
Anderson, Frank R.; and Castro, Albert J., 4,011,830.
Caterpillar Tractor Co.: *See—*
Bendtsen, Randall R., 4,011,957.
Bianchetta, Donald L.; and Field, Jesse L., Jr., 4,011,920.
Hahn, Ray H.; and Eftefield, Larry G., 4,011,669.
Hutchings, James P.; and Trittipoe, Jack H., 4,011,670.
Jones, Gary E.; Hart, Dean H.; and Brunka, Rueben R., 4,012,071.
Papasideris, Stamos I., 4,011,959.
Seibel, Jack N.; and Stump, Ronald C., 4,012,174.
Caveney, Robert John. Method of altering the friability of abrasive particles. 4,012,300, Cl. 204-157.10H.
Cederquist, Karl: *See—*
Selander, Stig; and Cederquist, Karl, 4,012,279.
Cega, Inc.: *See—*
Petersen, Christian C., 4,012,611.
Censier, Lucien; and Recoque, Alice Maria, to Compagnie Internationale pour l'Informatique. Bi-processor data handling system including automatic control of exchanges with external equipment and automatically activated maintenance operation. 4,012,717, Cl. 340-172.500.
Ceskoslovenska akademi ved: *See—*
Marek, Miroslav; Toman, Ludek; and Pecka, Jan, 4,012,304.
Chabannes, Francois Marie Maurice; Milot, Edouard Sylvain; Godfrin,

Pierre Raymond Louis; and Mailly, Pierre Philippe Louis, to Etat Francais. Spectroscopic analysis apparatus employing measurement and reference radiation. 4,012,145, Cl. 356-88.000.
Chamberlayne, John Walter, to U.S. Philips Corporation. Transmission line pulse transformers. 4,012,703, Cl. 333-24.00R.
Chamberlin, John M., to Monsanto Company. Steel member for reinforcing rubber compositions and method of making same. 4,011,899, Cl. 152-361.00R.
Chambers, Denzil G. Apparatus for forming plaques. 4,012,026, Cl. 249-134.000.
Chambers, John Philip; and Wright, Derek Thomas, to Marconi Company Limited, The; and Standard Telephone & Cables Limited. Conversion of color television signals to or from interlaced form. 4,012,772, Cl. 358-11.000.
Champion International Corporation: *See*—
Vincent, David N.; and Chang, Cheng Hsiung, 4,012,419.
Chan, David Cheong King, to Chevron Research Company. Fungicidal 3-(N-acyl-N-arylamino) lactones and lactams. 4,012,519, Cl. 424-274.000.
Chandler, Roy L., to Wood, L. Ray. Means for positioning a longitudinal bearing. 4,011,626, Cl. 16-129.000.
Chaney, Roy L.; and Rada, Sandor G., to Ralph Edwards Sportswear, Inc. Article of apparel collar and lapel construction. 4,011,599, Cl. 2-116.000.
Chang, Cheng Hsiung: *See*—
Vincent, David N.; and Chang, Cheng Hsiung, 4,012,419.
Chang, Enrique G. Forearm and wrist protector. 4,011,596, Cl. 2-16.000.
Chanslor-Western Oil and Development Company: *See*—
Jones, Jeffrey A., 4,012,207.
Chaplits, Donat Nikolaevich. Method for separation of isobutylene from C_4 hydrocarbon fractions. 4,012,456, Cl. 260-677.00A.
Chasin, David Gilbert; and Feltzin, Joseph, to ICI United States Inc. Copolymer having quaternary ammonium, n-alkoxyalkyl amido, and carboxy groups, optionally epoxy resin, and aqueous dispersions. 4,012,353, Cl. 260-29.6NR.
Chaudhari, Praveen; d'Heurle, Francois M.; and Gangulee, Amitava, to International Business Machines Corporation. Method of inhibiting hillock formation in films and film thereby and multilayer structure therewith. 4,012,756, Cl. 357-5.000.
Chaudhary, Sohan S., to ARCO Polymers, Inc. High impact graft copolymers. 4,012,462, Cl. 260-880.00R.
Cheek, Frank L. Aircraft descent profile calculator. 4,011,987, Cl. 235-88.00N.
Chelland, Joseph John; and Love, Fred Everett, to Johns-Manville Corporation. Method of preparing a mixture for making extruded resin articles. 4,012,348, Cl. 260-28.50R.
Chem Systems, Inc.: *See*—
Brownstein, Arthur M.; Jung, John A.; and Hansen, Robert, 4,012,423.
Sherwin, Martin B.; and Peress, Jimmy, 4,012,424.
Chemed Corporation: *See*—
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Chemetron Corporation: *See*—
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Chemfix Inc.: *See*—
Conner, Jesse R.; Zawadzki, Edward A.; and Polosky, Ronald J., 4,012,320.
Chen, Philip L., to Xerox Corporation. Input and output flying spot scanning system. 4,012,585, Cl. 358-285.000.
Cheney, Robert L.: *See*—
Sample, Winfield; and Cheney, Robert L., 4,012,694.
Cheng, Chin Huan; and Brubaker, Burton D., to Dow Chemical Company, The. Cryogenic vessel. 4,011,963, Cl. 220-9.0LG.
Cherney, Thomas M.; and Dodsworth, Robert S., to Minnesota Mining and Manufacturing Company. Solderless electrical contact. 4,012,102, Cl. 339-97.00P.
Chevron Research Company: *See*—
Buss, Waldeen C.; and Kluksdahl, Harris E., 4,012,313.
Chan, David Cheong King, 4,012,519.
Hotten, Bruce W., 4,012,368.
Kensler, Daniel L., Jr.; Kohn, Gustave K.; and Walgenbach, David D., 4,012,526.
Lavigne, Joe B., 4,012,438.
Meyer, Jarold A., 4,012,312.
Moore, Joseph E., 4,012,436.
Singer, Malcolm Scott, 4,012,225.
Toland, William G., 4,012,545.
Chidsey, Francis A., to Container Corporation of America. Carton erecting apparatus. 4,011,799, Cl. 93-53.0SD.
Chiyoda Kako Kensetsu Kabushiki Kaisha: *See*—
Morimoto, Tatsuo, 4,012,340.
Choi, Charles K., to Occidental Petroleum Corporation. Burner for decarbonizing organic char. 4,011,822, Cl. 110-28.00R.
Chorvat, Robert J.; and Pappo, Raphael, to G. D. Searle & Co. 11β-Alkyl-2-azaestratrienes and intermediates. 4,012,391, Cl. 260-289.0AZ.
Christensen, Inc.: *See*—
Jurgens, Rainer, 4,011,918.
Christensen, Justin D. Visual guide device for hitching vehicles. 4,012,056, Cl. 280-477.000.
Christopher, Chris J.: *See*—
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Covington, Wayne F.; Christopher, Chris J.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,012,725.
Chromalloy American Corporation: *See*—
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Chrysler Corporation: *See*—
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Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y.C.; and Fournier, Joseph T., Jr., 4,012,232.
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Model, Ernst, 4,012,370.
Roueche, Armand; and L'Eplattenier, Francois, 4,012,371.
Schwarzenbach, Kurt; Mueller, Helmut; and Rosenberger, Siegfried, 4,012,360.
Cincinnati Butchers' Supply Company, The: *See*—
Bordenave, Joseph Heber; and Falls, Robert, 4,011,820.
Cincinnati Milacron Chemicals, Inc.: *See*—
Hechenbleikner, Ingenuin; Kugele, Thomas G.; and Hussar, John F., 4,012,399.
Cities Service Company: *See*—
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Claisse, John Anthony; Gregory, Gordon Ian; and Warburton, William Kingston, to Glaxo Laboratories Limited. Oxadiazole and oxadiazoline derivatives. 4,012,377, Cl. 260-240.00D.
Clark, Allen L.: *See*—
Bowen, Russell H.; Clark, Allen L.; Davis, David C.; Gilbert, Walter E.; Glover, Wayne L.; Walsh, Richard J.; and Wehling, Robert G., 4,012,625.
Clark, David C.; and Barnard, John K., to Progressive Equipment Corporation. Electrostatic water treatment system. 4,012,310, Cl. 204-305.000.
Clark, Donald Lawrence; Fraunfelter, Floyd Samuel, Jr.; and Ruth, Robert Richard, to Black and Decker Manufacturing Company, The. Power miter saw. 4,011,782, Cl. 83-471.300.
Clarostat Mfg. Co., Inc.: *See*—
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Clausen, Helmut: *See*—
Ernst, Rudolf; Schneider, Fritz W.; and Clausen, Helmut, 4,012,025.
Clay, Bobby J.: *See*—
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Clay, Henry J., to Halliburton Company. Knockdown centralizer. 4,011,907, Cl. 166-241.000.
Cleaveland, Charles M., to Westinghouse Electric Corporation. Circuit-interrupters using spaced-apart bars for conductor-assemblies. 4,012,609, Cl. 200-50.0AA.
Clemens, Lawrence M., to Minnesota Mining and Manufacturing Company. Resinous repair pad. 4,012,553, Cl. 428-285.000.
Cline, Harvey E.: *See*—
Anthony, Thomas R.; and Cline, Harvey E., 4,012,236.
Clune, Michael Francis; and Shanebrook, John Richard, to Research Corporation. Prosthetic heart valve. 4,011,601, Cl. 3-1.500.
Coal Industry (Patents) Limited: *See*—
Martin, David James Reginald, 4,012,662.
Cobaugh, Robert Franklin; and Graeff, Norwood Claude, to AMP Incorporated. Female terminals. 4,012,107, Cl. 339-258.00P.
Cochran, Troy L.; Kirkpatrick, Melvin D.; and Walder, Robert J., to Union Carbide Corporation. Feeding and propelling system for the tape in a seed-tape manufacturing machine. 4,012,003, Cl. 242-55.000.
Coddington, Thomas Tucker, to Chrysler Corporation. Fuel filter and roll-over valve. 4,011,848, Cl. 123-136.000.
Coffy, Rene Louis: *See*—
Mouille, Rene Louis; Coffy, Rene Louis; Hancart, Michel Aime; and Mao, Daniel, 4,012,169.
Cohen, Harvey L., to Exxon Research and Engineering Company. Tire tread compositions having improved low temperature properties. 4,012,344, Cl. 260-4.00R.
Cohen, Leonard; and Connick, William J., Jr., to United States of America, Army. Thickened hydrocarbon fuels. 4,012,205, Cl. 44-7.00C.
Coir, Leo: *See*—
Meinecke, Klaus; Wilhelm, Dieter; Coir, Leo; Tillack, Jurgen; Samulowitz, Helmut; and Gebhardt, Karl, 4,011,642.
Coleman, Charles F.: *See*—
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McGhie, Russell Park; and Ferraro, Joseph George, 4,011,968.
Collin, David Trevor: *See*—
Lunts, Lawrence Henry Charles; and Collin, David Trevor, 4,012,444.
Coltrinari, Enzo: *See*—
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Columbus, Richard L., to Eastman Kodak Company. Biological fluid dispenser and separator. 4,012,325, Cl. 210-516.000.
Combustion Engineering, Inc.: *See*—
Accortt, Joseph Ittamar, 4,012,469.
Commissariat a l'Energie Atomique: *See*—
Delvalle, Pierre, 4,012,480.
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Commonwealth of Australia care of the Secretary Department of Health, The: *See—*
Robinson, David Errol, 4,011,750.
Compagnie Internationale pour l'Informatique: *See—*
Censier, Lucien; and Recoque, Alice Maria, 4,012,717.
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Computer Peripherals, Inc.: *See—*
Spitsbergen, Merlin D.; and Hughes, James G., 4,012,674.
Computer Specialties Corporation: *See—*
Silver, Edward S.; and Tucker, Robert E., 4,012,134.
Conner, Donald E.; and Fogel, Arnold W., to Van Dyk & Company, Incorporated. Quaternary halides of mink oil amides. 4,012,398, Cl. 260-404.500.
Conner, Jesse R.; Zawadzki, Edward A.; and Polosky, Ronald J., to Chemfix Inc. Method for improving the quality of contaminated waste water. 4,012,320, Cl. 210-45.000.
Connick, William J., Jr.: *See—*
Cohen, Leonard; and Connick, William J., Jr., 4,012,205.
Connor, David T.; and Von Strandtmann, Maximilian. Process for the cyclization of aryl (methylsulfinyl)-methyl ketones and novel compounds produced thereby. 4,012,422, Cl. 260-345.200.
Conrad, Rene A., to Dynaloc Corporation. Closed loop cleated belt/-grooved pulley conveyor system. 4,011,939, Cl. 198-840.000.
Container Corporation of America: *See—*
Chidsey, Francis A., 4,011,799.
Continental Group Inc., The: *See—*
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Continental Oil Company: *See—*
Maxson, Orwin G.; and Peterson, Marvin L., 4,011,615.
Nivens, Robert V.; Williams, Billy J.; Toole, Irvin, Jr.; and Fenton, Elliott C., 4,011,882.
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Cook, Edward H., Jr.: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., 4,012,303.
Cook, John C.; and Kerr, James D., to Teledyne Industries, Inc. Piezoelectric stress/strain intrusion detectors. 4,012,649, Cl. 310-8.300.
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Adams, Sally Lee; Martin, Fred David; and Cook, Michael M., 4,011,909.
Cooley, Denton A.; Reed, Charles C.; and Sharp, Russell G., to Texas Medical Products, Inc. Disposable surgical equipment tray. 4,011,944, Cl. 206-557.000.
Coons, Robert R.; and Hennessey, Richard G., to International Harvester Company. Means to present lubricating and cooling fluid to friction material in a wet brake system. 4,011,930, Cl. 192-113.00B.
Cooper, Glenn A., Jr., to United States of America, Agriculture. Delta culvert. 4,011,726, Cl. 61-16.000.
Copyer Co. Ltd.: *See—*
Serikawa, Shiro, 4,012,142.
Corey, Albert E.: *See—*
Baatz, James C.; and Corey, Albert E., 4,012,560.
Cornelis, Jean-Philippe. Nylon-6 filament and method of manufacture thereof. 4,012,557, Cl. 428-397.000.
Cornet, Andre, to DAMPERS Societe Anonyme. Oil-cooled piston for a heat engine. 4,011,797, Cl. 92-186.000.
Cosco, Inc.: *See—*
Neal, Jerry L., 4,011,821.
Courtois, Peter D., to Superior Concrete Accessories, Inc. Key-joint forming divider strip with upstanding screed adapted for use with concrete slabs. 4,012,024, Cl. 249-9.000.
Courvoisier, Guy, to Battelle Memorial Institute. Ski brake. 4,012,057, Cl. 280-605.000.
Covington, Wayne F.: *See—*
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Covington, Wayne F.; Christopher, Chris J.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,012,725.
Cox, Herbert L.: *See—*
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Cox, Percy T.; Meador, Richard A.; and Thompson, Larry W., to Texaco Inc. Radio frequency resistivity and dielectric constant well logging utilizing phase shift measurement. 4,012,689, Cl. 324-6.000.
Cozzini, Artemio S. Grinding machine. 4,011,689, Cl. 51-5.00D.
Crabtree, Allen, to Imperial Chemical Industries Limited. Reactive dyestuffs. 4,012,378, Cl. 260-240.00B.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. [1-Hydroxy-5-indanyloxy (or thio)]-alkanoic acids. 4,012,524, Cl. 424-308.000.
Crane, Merlin L., to Deutsch Company Electronic Components Division, The. Connector arrangement for thin, deflectable conductors. 4,012,093, Cl. 339-17.00F.
Crane Packing Company: *See—*
Inka, Egons, 4,012,273.
Creager, James J. Tree lighting assembly. 4,012,631, Cl. 240-10.00T.
Crockett, James R., Sr. Grille tender. 4,011,804, Cl. 99-421.00H.
Crosfield Electronics Limited: *See—*
Gascoigne, Richard M., 4,012,584.
Crosslen, Louis John, to Frank Mayer & Associates, Inc. Wristwatch display case having detachable flexible watch-supporting cuff. 4,011,942, Cl. 206-45.140.
Crowle, William G.; and Ostrowsky, Efrem M., to VCA Corporation. Safety actuator cap. 4,011,970, Cl. 222-321.000.
Crystal, Richard G., to Xerox Corporation. Novel photoconductive waterless lithographic printing masters, and process of preparation. 4,012,254, Cl. 96-1.500.
Cubic Productron, Inc.: *See—*
Schmidt, Gunter, 4,012,753.
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Wyckoff, James Kenneth, 4,011,931.
Cullinan, George J., to Eli Lilly and Company. Vinblastinoic acid. 4,012,390, Cl. 260-287.00B.
Cunningham, Donald W. Paper towel holder. 4,012,007, Cl. 242-55.540.
Curtis Instruments, Inc.: *See—*
Finger, Eugene P.; and Marwell, Edward M., 4,012,681.
Curtiss-Wright Corporation: *See—*
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DAGMA GmbH & Co.: *See—*
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D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corporation; and RAI Research Corporation. Trifluorostyrene sulfonic acid membranes. 4,012,303, Cl. 204-159.170.
Daimler-Benz Aktiengesellschaft: *See—*
Forster, Hans-Joachim M., 4,011,840.
Dakin, Hayes O., Jr.; Brunson, Lawrence A.; Reese, Frank L., deceased; and by Reese, Blanche C., executrix, to Westinghouse Electric Corporation. High-voltage circuit-interrupter having a closing resistance and improved shunting-resistance contacts therefor. 4,012,614, Cl. 200-144.0AP.
Dal Negro, Ruggero. Tape-supported slide fastener element. 4,011,895, Cl. 139-384.00B.
Damer, Harald; Kessler, Kurt; Kuhne, Ulrich; Schneider, Kurt; Unbehaun, Karl; Wilke, Manfred; and Franke, Johannes, to VVB Haushalts-und Verpackungsglas. Conveyor for containers for carrying objects of glass or similar materials, which objects are to be hardened chemically by surface treatment. 4,012,233, Cl. 134-75.000.
Damoisiaux, Anthony John; and Evans, Raymond George, to ITT Industries, Inc. Circuit termination device. 4,012,101, Cl. 339-97.00C.
Damon Corporation: *See—*
Frings, Christopher S.; Fendley, Ted W.; and Dunn, Ralph T., 4,012,196.
DAMPERS Societe Anonyme: *See—*
Cornet, Andre, 4,011,797.
Danielson, Nels, Jr.; and Nicklas, William H., to General Electric Company. Thermal compensation for color television picture tube aperture mask. 4,012,661, Cl. 313-405.000.
Danna, Peter A.; Holcomb, Richard A.; and Roethlein, Richard J., to Olin Corporation. Process for bonding titanium, tantalum, and alloys thereof. 4,011,981, Cl. 228-208.000.
Dart Industries Inc.: *See—*
Grusin, Gerald M., 4,011,672.
Data Packaging Corporation: *See—*
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Davenport, Arthur Clyde, to Dynapods, Inc. Autonomous variable density aircraft. 4,012,016, Cl. 244-97.000.
David Kopf Instruments: *See—*
Seiler, William, Jr., 4,011,869.
David, Siegfried, to Morgan Construction Company. Apparatus for trimming and/or subdividing mill product at a coil forming station. 4,011,780, Cl. 83-167.000.
Davidoff, Benjamin. Swimming pool cover. 4,011,607, Cl. 4-172.120.
Davies, Francis William; and Walcer, Joseph. Piston machine. 4,011,842, Cl. 123-61.00R.
Davies, Glyndwr John, to Glacier Metal Company Limited, The. Method of applying and bonding a bearing lining comprising a mixture of an arylene sulphide polymer and a metallic oxide to a backing material. 4,012,539, Cl. 427-195.000.
Davies, John W., III; Enters, Edward W.; and DuPas, Eugene A., to Gilson Bros. Co. Tiller with folding handle and clutch control. 4,011,913, Cl. 172-42.000.
Davis, Charles C., to Stokes-Trenton, Inc. Process for making plastic bowling pins. 4,012,386, Cl. 264-250.000.
Davis, D. Carter; and Sawant, Ulhas S., to Rexnord Inc. Crushing machine clearing system. 4,012,000, Cl. 241-290.000.
Davis, David C.: *See—*
Bowen, Russell H.; Clark, Allen L.; Davis, David C.; Gilbert, Walter E.; Glover, Wayne L.; Walsh, Richard J.; and Wehling, Robert G., 4,012,625.
Davis, Howard Coe; and Hoolsema, Nicholas, to Delmarco Management Ltd. Automatic valve assembly and heater/humidifier converter for clothes dryer. 4,011,662, Cl. 34-90.000.
Davis, Kenneth Paul, to Magnatex Limited. Vehicle rear-view mirror mounting arrangement. 4,011,769, Cl. 74-479.000.
Davis, Robert L.; and Howells, Joseph A., to Science Accessories Corporation. Position determining apparatus and transducer therefor. 4,012,588, Cl. 178-18.000.
Davis, Wallace J. Rotary tool exhaust hood. 4,011,792, Cl. 90-11.00R.
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Projection device for photogrammetrical purposes. 4,012,136, Cl. 353-102.000.

Dead Sea Bromine Company Ltd.: *See—*
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Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin. Enzyme separation. 4,012,283, Cl. 195-66.00R.

Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin. Enzyme separation. 4,012,568, Cl. 526-50.000.

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Deatcher, John H.: *See—*
Kopacki, Adam F.; and Deatcher, John H., 4,012,356.

DeBaun, Jack R.; Pallos, Ferenc M.; and Teach, Eugene G., to Stauffer Chemical Company. N,N-Dimethyl-N'-phenylthiocarbamyl formamidine hydrochloride and its use as an anti-inflammatory agent. 4,012,527, Cl. 424-323.000.

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Deere & Company: *See—*
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Mott, Roger Eugene; and Bichel, Darwin Carl, 4,011,709.
Tessenske, Dean James, 4,011,768.

DeFrees, Joseph H. Manifold-valve structure. 4,011,885, Cl. 137-267.000.

de Jonge, Frederik Ate, to U.S. Philips Corporation. Record carrier and device for playing back same. 4,012,777, Cl. 360-77.000.

de Leeuw, Jan, to AutoChem Instrument Aktiebolag. Apparatus for removing liquid from the inside of a test tube. 4,012,200, Cl. 23-259.000.

Delin, Lars Magnus. Adjustable wrench. 4,011,778, Cl. 81-186.000.

Delisle, Lucien: *See—*
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Delmarco Management Ltd.: *See—*
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DeLuca, Paul V.; and Carney, William V., to Porta Systems Corporation. Telephone connector block apparatus. 4,012,096, Cl. 339-18.00R.

Delvalle, Pierre, to Commissariat a l'Energie Atomique. Isotopic enrichment of uranium with respect to an isotope. 4,012,480, Cl. 423-10.000.

DeMayo, William D.: *See—*
Eldridge, John D., Jr.; and DeMayo, William D., 4,011,693.

Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., to American Home Products Corporation. Process for preparing pyrano[3,4-b]indole or thio pyrano[3,4-b]indole derivatives. 4,012,417, Cl. 260-326.5SA.

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Dempsey, Richard C., to International Telephone and Telegraph Corporation. Multimode loop antenna. 4,012,742, Cl. 343-742.000.

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Watts, Tom J., 4,012,552.

Denzel, Theodor; Hoehn, Hans; and Schulze, Ernst, to E. R. Squibb & Sons, Inc. Pyrazolo[3',4'-2,3]pyrido[4,5-e]b-benzo-1,5-diazepinones. 4,012,373, Cl. 260-239.30P.

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Lifshits, Viktor Senderovich; Baranov, Vladimir Nikitich; Shklyanov, Llonid Pavlovich; Brjukvina, Olimpiada Mikhailovna; Osinskaya, Tamila Iosifovna; Dergachev, Nikolai Makarovich; Pevnev, Arkady Alexeevich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; and Khomenko, Vladimir Ivanovich, 4,012,619.

Descamps, Marcel; and Inion, Henri, to Labaz. Indole derivatives. 4,012,394, Cl. 260-293.610.

De Sousa, Emilio Jose Jordao. Sectional toy block. 4,011,683, Cl. 46-25.000.

Deutsch Company Electronic Components Division, The: *See—*
Crane, Merlin L., 4,012,093.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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de Wiet, Bernard: *See—*
Seguin, Claude; and de Wiet, Bernard, 4,012,029.

Deyrup, Alden J., to Du Pont de Nemours, E. I., and Company. Polyvinyl alcohol microgels. 4,012,352, Cl. 260-29.6BM.

d'Heurle, Francois M.: *See—*
Chaudhari, Praveen; d'Heurle, Francois M.; and Gangulee, Amitava, 4,012,756.

Dhingra, Ashok Kumar: *See—*
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Di/An Controls, Inc.: *See—*
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Dialoc Corporation of America: *See—*
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Diamond, Martin J.: *See—*
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Dickerson, Dorsey G.; and Merkel, Paul B., to Eastman Kodak Company. Activator-stabilizers in heat developable photographic materials and processes. 4,012,260, Cl. 96-114.100.

Dickerson, Norman Kingston; and Turley, Barry Jay, to General Electric Company. Field boost arrangement for separately excited D-C traction motors of a vehicle propulsion system. 4,012,680, Cl. 318-338.000.

Dickinson, James M.; and Riley, Robert E., to United States of America, Energy Research and Development Administration. Tungsten-nickel-cobalt alloy and method of producing same. 4,012,230, Cl. 75-212.000.

Dicks, Charles E.; and Burton, Clifford O., to E. W. Bowman Incorporated. Annealing lehr. 4,012,190, Cl. 432-.

Did-Mor Engineering and Manufacturing Co.: *See—*
Gagliardi, Joseph F., 4,011,846.

Diel, Peter J.; and Schmid, Wolfgang, to Ciba-Geigy Corporation. Animal feeds containing quinoxaline-di-n-oxide derivatives. 4,012,512, Cl. 424-250.000.

Dieter Graesslin Feinwerktechnik: *See—*
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Dietrich, Rolf; and Gahler, Egon, to Braun Aktiengesellschaft. Ignition arrangement for an electronic flashtube. 4,012,664, Cl. 315-241.00P.

Diggs, Richard E. Metal building with integrated hot water heating system. 4,011,989, Cl. 237-59.000.

Di Marco, Aurelio; Canevazzi, Graziana; Grein, Arpad; Orezzi, Piergiuseppe; and Gaetani, Marcello, to Societa' Farmaceutici Italia, S.p.A. Process of preparation of antibiotic F.I. 1762 derivatives. 4,012,284, Cl. 195-80.00R.

Dir, Gary A.: *See—*
Adams, James E.; and Dir, Gary A., 4,012,119.

Dirlam, John P., to Pfizer Inc. Antibacterial quinoxaline 1,4-dioxides. 4,012,385, Cl. 260-250.0QN.

Disharoon, Gary Siegle. Air conditioner window sash. 4,011,687, Cl. 49-70.000.

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Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Dobson, Thomas A.; and Jirkovsky, Ivo L., 4,012,417.
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 4,012,511.

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Doerr, Richard L., to Olin Corporation. Oxidation of vat or sulfur dyes with vanadate activated bromate or iodate. 4,012,192, Cl. 8-34.000.

Doherty, Paul R.; and Johnson, Robert W., to Helix Technology Incorporated. Heat-stationed bayonet connector for cryogenic fluid lines. 4,011,732, Cl. 62-55.000.

Donau-Pharmazie Gesellschaft m.b.H.: *See—*
Zellner, Hugo, deceased, 4,012,389.

Doucet, Leonard A.; and Grubb, Richard M., to Augat, Inc. Coaxial interface adaptor having dual-in-line configuration. 4,012,095, Cl. 339-17.00C.

Dougherty, Herbert W., to Exxon Research and Engineering Company. Catalyst-containing fibers and the polymerization of olefins thereon. 4,012,342, Cl. 260-2.50B.

Doughty, Joseph B.; and Schulerud, Carl F., to Westvaco Corporation. Decorative laminate with care of newsprint and wood pulp. 4,012,561, Cl. 428-531.000.

Douglas Dynamics Corporation: *See—*
Simonds, George D., Jr., 4,012,175.

Douglass, Larry V.; Leonard, Jerome; and Minch, Morris L., to Motorola, Inc. Plug-in module for electronic device having component forming a guide for aligning the module. 4,012,672, Cl. 361-422.000.

Doversberger, Richard A., to Westinghouse Air Brake Company. Valve and responsive circuit for anti-skid hydraulic braking system. 4,012,081, Cl. 303-115.000.

Doversberger, Richard A., to Westinghouse Air Brake Company. Control circuit for anti-skid hydraulic braking system. 4,012,082, Cl. 303-116.000.

Dow Chemical Company, The: *See—*
Cheng, Chin Huan; and Brubaker, Burton D., 4,011,963.
Layne, Gilbert S.; and Huml, James O., 4,012,493.
Nimerick, Kenneth H., 4,012,355.
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Dow Corning Corporation: *See—*
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Doyle, Frank Peter; Cantello, Barrie Christian Charles; Buckle, Derek Richard; and Smith, Harry, to Beecham Group Limited. 2-Cyano indan-1,3-diones. 4,012,407, Cl. 260-465.00R.

Doyle, Terrence W.: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,012,383.

DPD Mfg. Co., Inc.: *See—*
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Dragerwerk Aktiengesellschaft: *See—*
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Frankenberger, Horst, 4,011,859.
Hausler, Eberhard, 4,011,753.
Heller, Dieter; and Hannemann, Helmut, 4,011,760.

Drake, J. Howard. Variable displacement hydraulic pump apparatus. 4,011,722, Cl. 60-465.000.

Dreckmann, Karl: *See—*
Lehmacher, Hans; Kluppel, Heinz-Eugen; and Dreckmann, Karl, 4,011,978.

Dreer, Gottfried. Process for the manufacture of fillers from solid waste. 4,012,231, Cl. 106-288.00B.

Dresser Industries, Inc.: *See—*
Hunter, Melvel P.; Gillenwater, Karl E.; and Warren, Henry J., 4,012,328.
Kunderman, Fred Kurt, 4,012,085.

Drori, Mordeki. Liquid-level valving device particularly useful as automatic relief valve. 4,011,884, Cl. 137-202.000.

Drori, Mordeki. Fluid-driven motor and fertilizer feeding device utilizing same. 4,012,176, Cl. 417-405.000.

Dubois, Robert, to Plastiroute SA. De-icing compositions contained in road surface material. 4,012,537, Cl. 427-138.000.

Duceppe, Rolland R. Multi-adjustable electric motor support. 4,012,021, Cl. 248-23.000.

Dudek, Ronald P.; Kosmos, Peter; and Tesk, John A., to Howmedica, Inc. Low intrinsic value alloys. 4,012,228, Cl. 75-134.00C.

Duggan, George L.: *See—*
Passmore, Edmund M.; Duggan, George L.; Anderson, Warren A.; and Labadini, William M., 4,012,659.

Dunaevsky, Vladimir Izrailevich; Krikly, Nikolai Mikhailovich; Kotelevets, Eduard Sergeevich; Apterman, Vladilen Nikolaevich; Oginsky, Mikhail Ilich; Pliskanovsy, Stanislav Tikhonovich; and Kaushansky, Boris Ioinovich. Furnace of a continuous metal strip heat-treatment plant. 4,012,028, Cl. 266-103.000.

Dunn, Ralph T.: *See—*
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DuPas, Eugene A.: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
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Riewald, Paul Gordon; Krueger, William Henry; and Dhingra, Ashok Kumar, 4,012,204.
Smedberg, George Elmer, 4,012,547.

Dupree, Hans-Werner. Corner connector for board shaped component parts. 4,011,706, Cl. 403-231.000.

Durwin, Robert J.; and Mancini, Joseph H., to United Technologies Corporation. Threadless locking device. 4,012,154, Cl. 403-261.000.

Dvorak, Howard A.; and Studnick, William R., to Western Electric Company, Inc. Flow-over mass soldering. 4,011,980, Cl. 228-180.00R.

Dwyer Instruments, Inc.: *See—*
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Dykes, Wiley V.: *See—*
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Dynaloc Corporation: *See—*
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Dynamit Nobel Aktiengesellschaft: *See—*
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Dynapods, Inc.: *See—*
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Dynatherm Corporation: *See—*
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E-H Research Laboratories, Inc.: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
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Blanding, Douglass L., 4,012,793.
Bloom, Richard M., 4,012,792.
Columbus, Richard L., 4,012,325.
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Yip, James Kwok-Fun, 4,011,721.

Ebauches S.A.: *See—*
Besson, Rene, 4,012,700.

Ebel, Bruno; Krumholz, Gunter; and Rahn, Paul, to Meyer, Roth & Pastor Maschinenfabrik GmbH. Method and apparatus for the successive welding of consecutive chain links. 4,012,618, Cl. 219-52.000.

Ebel, Robert Henry, to American Cyanamid Company. Method for improving physical properties of catalyst materials through the incorporation of fines therein and catalyst prepared by the method. 4,012,339, Cl. 252-463.000.

Ebersberger, Josef, deceased: *See—*
Blank, Heinz-Ulrich; Wedemeyer, Karlfried; and Ebersberger, Josef, deceased, 4,012,442.

Ebersberger, Thea, heiress: *See—*
Blank, Heinz-Ulrich; Wedemeyer, Karlfried; and Ebersberger, Josef, deceased, 4,012,442.

Eccleston, Harold F., Jr.: *See—*
Stosz, Max J., Jr.; and Eccleston, Harold F., Jr., 4,011,818.

Eckols, Clyde S., to Velvet Chemical Co. Iodine mineral oil solution for preventing bovine mastitis. 4,012,504, Cl. 424-150.000.

Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 9,10-Secoestrane derivatives and their production. 4,012,420, Cl. 260-340.700.

Edwards, John Lawton: *See—*
Braithwaite, John Colin; and Edwards, John Lawton, 4,011,690.

Edwards, Robert L., Jr. Card index box. 4,012,087, Cl. 312-183.000.

Edwards, Steven F.; and Pritchett, James D., to Thermalloy Incorporated. Heat sink with parallel flat faces. 4,012,769, Cl. 357-81.000.

Edwin Cooper and Company Limited: *See—*
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Eftefield, Larry G.: *See—*
Hahn, Ray H.; and Eftefield, Larry G., 4,011,669.

Egbers, Gerhard; and Artzt, Peter, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Thread drawoff tube for open-end spinning machines. 4,011,712, Cl. 57-58.890.

Egorov, Georgy Borisovich: *See—*
Besprozvanny, Robert Matveevich; Abramson, Iosif Gershevich; Egorov, Georgy Borisovich; Nudelman, Rafail Manusovich; and Nikiforov, Jury Vasilievich, 4,012,639.

Eibeck, Richard E.: *See—*
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Eicker, Hartmut, to Westfalische Berggewerkschaftskasse. Method and apparatus for determining the concentration of one gaseous component in a mixture of gases. 4,012,692, Cl. 324-71.0SN.

Eigenmann, Ludwig. High efficiency reflecting system, and method. 4,012,114, Cl. 350-104.000.

Eigenmann, Ludwig. Method and devices for road surface marking. 4,012,247, Cl. 156-71.000.

Elastogran Maschinenbau GmbH & Co., Firma: *See—*
Ernst, Rudolf; Schneider, Fritz W.; and Clausen, Helmut, 4,012,025.

Eldridge, John D., Jr.; and DeMayo, William D. Cleaner for cauterizing implements. 4,011,693, Cl. 51-354.000.

Electric Power Research Institute, Inc.: *See—*
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Electrical Remote Control Company, Ltd.: *See—*
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Electromagnetic Sciences, Inc.: *See—*
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Elevator Equipment Co.: *See—*
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Eli Lilly and Company: *See—*
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Beck, James Richard; and Gajewski, Robert Peter, 4,012,388.
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Murphy, Patrick J.; and Nickander, Rodney C., 4,012,525.
Spry, Douglas O., 4,012,380.

Elmer, Willard Owen. Field marking system. 4,011,914, Cl. 172-126.000.

Embinder, Donald N. Golf club carrier. 4,012,051, Cl. 280-47.190.

Emery Industries, Inc.: *See—*
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Endo, Takaya: *See—*
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Energy Systems, Inc.: *See—*
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Engdahl, Jean, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Process for manufacturing piezoelectric resonators and resonators resulting from such process. 4,012,648, Cl. 310-8.200.

Engdahl, Karl Torsten Lennart, to Flymo Societe Anonyme. Device for limiting pivotal movements of a lawn mower handle. 4,012,052, Cl. 280-47.37R.

Engdahl, Lawrence W.; Batter, John F., Jr.; and Stout, Karl J., to Raytheon Company, a part interest. Scanning gamma camera. 4,012,636, Cl. 250-363.00S.

Engelhard Minerals & Chemicals Corporation: *See—*
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Engelman, Stefan. Spectacle rack. 4,011,953, Cl. 211-13.000.

Enger, Carl C., to Case Western Reserve University. Implantable electric terminal for organic tissue. 4,011,861, Cl. 128-2.06E.

Engle, Thomas H., to General Signal Corporation. Pneumatic to hydraulic converter with integral dump chamber. 4,012,080, Cl. 303-114.000.

Enoki, Kichiji; Fukui, Takeo; Yamamoto, Takeo; Okada, Toshirou; and Miyazaki, Yoshiaki, to Nippon Soda Company Limited. Process for the separation of 4,4'-dichlorodiphenylsulfone. 4,012,451, Cl. 260-607.0AR.

Enters, Edward W.: *See—*
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Environmental Research Institute of Michigan: *See*—
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Envirotech Corporation: *See*—
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Ostlund, Sven E.; and Bailey, Robert S., Sr., 4,012,316.

Erdmann, Jurgen: *See*—
Walter, Arthur; and Erdmann, Jurgen, 4,012,635.

Erickson, Lewis C. Radial hydraulic pump or motor with improved pistons and slippers. 4,011,796, Cl. 91-488.000.

Ericson, Eric Axel; and Kaufhold, Frederick Daniel, to General Electric Company. Drawout apparatus having improved trip interlock. 4,012,610, Cl. 200-50.0AA.

Ernst Mohrbach KG: *See*—
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Ernst, Rudolf; Schneider, Fritz W.; and Clausen, Helmut, to Elastogran Maschinenbau GmbH & Co., Firma. Mold for plastics, particularly multi-component plastics injection mold having blind channel. 4,012,025, Cl. 249-105.000.

Erpenbach, Heinz; Gehrmann, Klaus; Joest, Herbert; and Zerres, Peter, to Hoechst Aktiengesellschaft. Continuous production of n-butylacrylate free from dibutylether. 4,012,439, Cl. 260-486.00R.

Ershov, Vladislav, Ivanovich; and Livenko, Nikolai Dmitrievich. Method and means for shaping parts by hydraulic extrusion. 4,011,744, Cl. 72-57.000.

Erwin Sick Optik-Electronik: *See*—
Walter, Arthur; and Erdmann, Jurgen, 4,012,635.

Eshelman, Frank R. Solar collector. 4,011,855, Cl. 126-270.000.

Eskeli, Michael. Rotor with recirculation. 4,012,164, Cl. 415-53.00R.

Eslien, Dean R.; and Salnick, James, to Ultra Plating Corporation. Apparatus for manufacturing pellet sizing screen rods. 4,012,309, Cl. 204-297.00W.

Espig, Winfried, to Prontor-Werk Alfred Gauthier GmbH. Photographic camera with electromagnetic actuator of the shutter segments. 4,012,751, Cl. 354-234.000.

Essenmacher, Albert M., to Burroughs Corporation. Adaptive information signal discriminator. 4,012,715, Cl. 340-146.3AG.

Esser, Leonard Jan Maria, to U.S. Philips Corporation. Bulk channel charge transfer device with bias charge. 4,012,758, Cl. 357-24.000.

Esser, Leonard Jan Maria, to U.S. Philips Corporation. Bulk channel charge transfer device. 4,012,759, Cl. 357-24.000.

Estebanell, Juan Barcons. Combing-cleaning device for universal cards. 4,011,631, Cl. 19-100.000.

Esterowitz, Leon: *See*—
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Everett/Charles, Inc.: *See*—
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Everson, Kirke B., Jr. Variable stroke compressor. 4,012,173, Cl. 417-259.000.

Ex-Cell-O Corporation: *See*—
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Exxon Nuclear Company, Inc.: *See*—
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Exxon Research & Engineering Co.: *See*—
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Falls, Robert: *See*—
Bordenave, Joseph Heber; and Falls, Robert, 4,011,820.

Fang, Frank Fu; and Herrell, Dennis James, to International Business Machines Corporation. Powering scheme for josephson logic circuits which eliminates disturb signals. 4,012,646, Cl. 307-306.000.

Farber, Elliott, to La Maur Inc. Vinyl copolymers cross-linked with allyl diglycol carbonate. 4,012,364, Cl. 260-77.50D.

Farber, Elliott, to La Maur Inc. Hair-care composition containing a thermoplastic polymer. 4,012,501, Cl. 424-47.000.

Farrell, John J., to Farrell Patent Company. Injection blow molding with preliminary injection blow mold. 4,012,187, Cl. 425-242.00B.

Farrell Patent Company: *See*—
Farrell, John J., 4,012,187.

Farrington, Gregory C.; and Roth, Walter L., to General Electric Company. Sealed lithium-sodium electrochemical cell with sodium beta-alumina electrolyte. 4,012,563, Cl. 429-104.000.

Faulkner, Bobby P.: *See*—
Goldberger, William M.; and Faulkner, Bobby P., 4,012,314.

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Faxen, Per Torsten: *See*—
Karlsson, Frans Harry; and Faxen, Per Torsten, 4,011,605.

Fedolfi, James L., to Roddy, Luke J. Building construction. 4,011,697, Cl. 52-90.000.

Fedorchenko, Ivan Mikhailovich; Pugin, Vasily Sergeevich; Ablov, Vladimir Itskhok-Nukhimovich; Fridman, July Yakovlevich; and Goldberg, Mikhail Shaevich. Mouthpiece for smoking tobacco. 4,011,877, Cl. 131-187.000.

Fedorov, Boris Efimovich: *See*—
Model, Evgenia Iosifovna; Savina, Anna Sergeevna; Nurov, Jury Lvovich; Piorunsky, Alexandr Nikolaevich; Fedorov, Boris Efimovich; and Ivanov, Vladimir Mikhailovich, 4,012,695.

Fehr, Werner: *See*—
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Fenton, Elliott C.: *See*—
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Fernandes, Gilbert. Magnetic hockey game. 4,012,040, Cl. 273-85.00A.

Ferraro, Joseph George: *See*—
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Ferro, Armand P.; and Walden, John P., to General Electric Company. Method and apparatus for reducing inverter no-load losses. 4,012,683, Cl. 321-45.00R.

Ferro, Armand P.; and Temple, Victor A. K., to General Electric Company. Self-protected semiconductor device. 4,012,761, Cl. 357-38.000.

Ferro Corporation: *See*—
Kaye, Saul; and Iverson, Robert L., 4,012,359.
Oswitch, Stanley; Golownia, Robert F.; and Kipp, Kevin K., 4,012,542.

Feuerman, Arnold I. Vaporized fuel for internal combustion engine and method and apparatus for producing same. 4,011,843, Cl. 123-119.00E.

Fiala, Richard J.; Scott, Thomas L.; and Wright, Kenneth N., to A. E. Staley Manufacturing Company. Molasses impregnated bagasse pith animal feed. 4,012,535, Cl. 426-658.000.

Ficht, Paulette Gisele: *See*—
Brouard, Claude Marie Henri Emile; and Ficht, Paulette Gisele, 4,012,369.

Field, Jesse L., Jr.: *See*—
Bianchetta, Donald L.; and Field, Jesse L., Jr., 4,011,920.

Fields, Ellis K., to Standard Oil Company (Indiana). Iodination process. 4,012,454, Cl. 260-650.00R.

Filac Corporation: *See*—
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Filson, John Richard, to Minnesota Mining & Manufacturing Company. Insulated terminal construction. 4,012,106, Cl. 339-211.000.

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FMC Corporation: *See*—
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Greiser, John W., to Itek Corporation. Helix-loaded spiral antenna. 4,012,744, Cl. 343-895.000.
Grethe, Guenter; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Processes and intermediates for cis or trans 2-or 3-(1-acyl-3-vinyl-4-piperidine)acetic or propionic acid esters. 4,012,396, Cl. 260-293.770.
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Lambrecht, Dietrich; Weghaupt, Erich; Grimm, Lothar; and Munch, Helmut, 4,012,049.
Grimsley, Ernest E. Portable boring bar. 4,011,793, Cl. 90-12.500.
Groeger, Theodore Oskar. Tireroller. 4,011,919, Cl. 180-1.00R.
Gropp, Joseph A., Sr., to Lawrence Peska Associates, Inc., a part interest. Sanding device for a motor vehicle. 4,012,062, Cl. 291-25.000.
Grossi, Benedetto; and Budrys, Ignas, to General Signal Corporation. Alarm control system. 4,012,727, Cl. 340-213.00R.
Grossi, James. Hangman game apparatus. 4,012,044, Cl. 273-130.00E.
Grubb, Richard M.: *See*—
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Grubb, Robert G., to Allis-Chalmers Corporation. Fabricated crown plate for Francis-type hydraulic turbine runner. 4,012,170, Cl. 416-186.00R.
Gruber, Robert J.; and Germano, Nicholas J., to Xerox Corporation. Imaging process utilizing 3-bromo-N-2''-pyridyl-8,13-dioxodinaphtho-(2,1-b;2',3'-d)-furan-6-carboxamide. 4,012,252, Cl. 96-1.0PE.
Grund, Peter, to Messer Griesheim GmbH. Method and device for removal of fins from workpieces. 4,011,691, Cl. 51-314.000.
Grusin, Gerald M., to Dart Industries Inc. Mounting frame. 4,011,672, Cl. 40-16.200.
GTE Automatic Electric Laboratories Incorporated: *See*—
Blackburn, Tom L.; and Wisotzky, Otto G., 4,012,688.
Weber, Vernon F., 4,012,702.
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GTE Sylvania Incorporated: *See*—
Passmore, Edmund M.; Duggan, George L.; Anderson, Warren A.; and Labadini, William M., 4,012,659.
Gueret, Pierre Leopold, to International Business Machines Corporation. Josephson junction logic element. 4,012,642, Cl. 307-212.000.
Guichard, Paul. Respiratory apparatus. 4,011,864, Cl. 128-140.00N.
Guilbaud, Antoine L.; and Spector, George. Welding mask window door automatic operation. 4,011,594, Cl. 2-8.000.
Guillet, Henri. Frames for eyeglasses. 4,012,130, Cl. 351-114.000.
Guillory, Michael P.: *See*—
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Gulf & Western Industries, Inc.: *See*—
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Gunderson, Ralph R. Adjustable deflector for snow removal machine. 4,011,668, Cl. 37-43.00R.
Haass, Adolf, to Siemens Aktiengesellschaft. Circuit arrangement for two-wire full duplex data transmission. 4,012,590, Cl. 178-58.00R.
Habermann, Helmut; and Brunet, Maurice, to Societe Anonyme dite: Societe Europeenne de Propulsion. Magnetic bearings. 4,012,083, Cl. 308-10.000.
Hadbavny, Leonard P.: *See*—
Vegh, Elmer S.; Castle, William F.; Hadbavny, Leonard P.; Klier, Donald F.; and Schwerzler, David S., 4,011,805.
Haffer, Gregor: *See*—
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Hagen, Paul; and Delisle, Lucien, to Pelco Tools Limited. Portable welding jig. 4,011,979, Cl. 228-49.000.
Haggard, Richard A.: *See*—
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Haggerty, John S.; Menashi, Wilson P.; and Wenckus, Joseph F., to Arthur D. Little, Inc. Apparatus for forming refractory fibers. 4,012,213, Cl. 65-13.000.
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Hagood, Jerry W.: *See*—
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Hahn, James R., to Dow Corning Corporation. Silacyclopentenyl-bis-epsilon-caprolactam. 4,012,375, Cl. 260-239.30R.
Hahn, Ray H.; and Eftefield, Larry G., to Caterpillar Tractor Co. Power scraper with apron on a movable pivot axis. 4,011,669, Cl. 37-126.0AD.
Hahn, Siegfried: *See*—
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Hall, Henry C., to Northwest Engineering Company. Conveyor positioning structure for loading and conveying machines. 4,011,936, Cl. 198-517.000.
Hall, Joe, Jr.: *See*—
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Hall, Wilbur S.; and Leister, Harry M., to Amchem Products, Inc. Stabilization of acidic aqueous coating compositions containing an organic coating-forming material. 4,012,351, Cl. 260-29.60R.
Haller, Andreas; and Kundisch, Heiner, to Irion & Vosseler. Electric pulse counter and plastic housing therefor. 4,012,624, Cl. 235-92.00C.
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Halm Instrument Co., Inc.: *See*—
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Halsey, Richard J.; and Heillman, Melvin R., to Vendo Company, The. Electronic system device for control of ingredient dispensing in a cup beverage vendor. 4,011,967, Cl. 222-70.000.
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Hamamatsu Terebi Kabushiki Kaisha: *See*—
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Hanson, Marlin Marshall; Torok, Ernest James; and Lund, Roger Edward, to Sperry Rand Corporation. Method of improving the operation of a single wall domain memory system. 4,012,724, Cl. 340-174.0TF.
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, to Hamamatsu Terebi Kabushiki Kaisha. Semiconductor cold electron emission device. 4,012,760, Cl. 357-30.000.
Harbin, Frank; and Slater, Harry W., to Lear Siegler, Inc. Damper for heating/cooling system. 4,011,903, Cl. 165-27.000.
Hargis, Ivan Glen; and Livigni, Russell Anthony, to General Tire & Rubber Company, The. Alkaline earth metal organometallic compounds, their preparation by metallation and catalysts comprising same. 4,012,336, Cl. 252-431.00R.
Harper, Henry J. Adjustable seat-back mechanism. 4,012,158, Cl. 403-107.000.
Harper, James G., to Texas Instruments Incorporated. Magnetic bubble memory packaging arrangement and its method of fabrication. 4,012,723, Cl. 340-174.0TF.
Harris, Charles V.; Pickett, Lowell F.; and Schlanert, George A., to McDonnell Douglas Corporation. Steering range selector. 4,011,771, Cl. 74-522.000.
Harrison, Henry, to Halm Instrument Co., Inc. Cold storage tank. 4,011,736, Cl. 62-260.000.

Hart, Dean H.: *See—*
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Hassler, Craig R.: *See—*
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Hauge, Douglas Oliver, to United States Gypsum Company. Phosphate process. 4,012,491, Cl. 423-309.000.
Hauni-Werke Korber & Co., KG: *See—*
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Wahle, Gunter; and Gomann, Jurgen, 4,011,966.
Hausler, Eberhard, to Dragerwerk Aktiengesellschaft. Method and device for measuring the flow velocity of media by means of ultrasound. 4,011,753, Cl. 73-194.00A.
Hawkins, Charles T., to PPG Industries, Inc. Reciprocating device having vibration reducing means. 4,011,833, Cl. 118-323.000.
Hawkins, Ronald G., to Aluminum Company of America. Clip lock clamping tool. 4,011,649, Cl. 29-267.000.
Hawkins, Ronald G., to Aluminum Company of America. Frame-type damping spacer. 4,012,581, Cl. 174-42.000.
Hawkins, Ronald G., to Aluminum Company of America. Damping spacers for conductor bundles. 4,012,582, Cl. 174-42.000.
Hawkins, William R., to Newcomb Audio Products Co. Acoustic damping turntable and adapter. 4,012,048, Cl. 274-39.00R.
Haws, Gerald W.: *See—*
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Hayashi, Toshio, to Kayabakoyo-Kabushiki-Kaisha. Method for the recycle treatment of waste water from chromium plating. 4,012,318, Cl. 210-28.000.
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Hayes-Albion Corporation: *See—*
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Hayes, John B.; Haws, Gerald W.; and Gogarty, William B., to Marathon Oil Company. Water-in-oil microemulsion drilling fluids. 4,012,329, Cl. 252-8.50P.
Hechenbleikner, Ingenuin; Kugele, Thomas G.; and Hussar, John F., to Cincinnati Milacron Chemicals, Inc. Transition metal complexes with trivalent phosphorus compounds. 4,012,399, Cl. 260-439.00R.
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Heilweil, Israel J., to Mobil Oil Corporation. Trap to remove metals utilizing a sulfur modified substrate and electrophoresis. 4,012,315, Cl. 208-253.000.
Heine, Helmut A., to Optotechnik, GmbH; and Propper Manufacturing Company, Inc. Power supply for illuminated instrument. 4,012,686, Cl. 323-22.00T.
Helix Technology Incorporated: *See—*
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Heller, Dieter; and Hannemann, Helmut, to Dragerwerk Aktiengesellschaft. Measuring probe for gas measuring apparatus. 4,011,760, Cl. 73-421.50R.
Hellerman Cassettes Limited: *See—*
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Henderson, Albert J.; and Krol, John E., to Neville Chemical Company. Production of highly soluble, solid, resinous, highly chlorinated alpha-olefinic hydrocarbon material. 4,012,306, Cl. 204-163.00R.
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Herchenroeder, Robert B.; and Augustine, Coleman M., Jr., to Cabot Corporation. Ductile cobalt-base alloys. 4,012,229, Cl. 75-171.000.
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Herrell, Dennis James: *See—*
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Herrin, Carlos B., to Monarch Marking Systems, Inc. Coded record and method of and system for interpreting the record. 4,012,716, Cl. 340-146.30Z.
Herring, Gerald L., to Lawrence Peska Associates, Inc., a part interest. Removable license plate holder. 4,011,675, Cl. 40-209.000.
Herrmann, Manfred: *See—*
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Holdeman, Adin Frank; and Ratzlaff, Howard James, 4,011,998.
Hester, Jackson B., Jr., to Upjohn Company, The. Organic compounds and process. 4,012,413, Cl. 260-308.00R.
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Heytow, Solomon. Device for selectively detecting different kinds and sizes of metals. 4,012,690, Cl. 324-41.000.
Higdon, Mary Kathryn; and Speas, Zalita Higdon. Flower corsage frame. 4,011,677, Cl. 47-55.000.
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Hinrichsen, Robert Alfred; and Plewes, John Travis, to Bell Telephone Laboratories, Incorporated. Cu-Ni-Sn alloy processing. 4,012,240, Cl. 148-11.50C.
Hirosawa, Yoshiaki; Nomura, Toshio; and Iiyama, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Automatic choke valve apparatus in an internal combustion engine. 4,011,844, Cl. 123-119.00F.
Hirozawa, Stanley T., to BASF Wyandotte Corporation. Method for wetting hydrophobic diaphragms for use in chlor-alkali cells. 4,012,541, Cl. 427-243.000.
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Hodson, Harold Francis; and Batchelor, John Frederick, to Burroughs Wellcome Co. Cyclic sulphur compounds. 4,012,499, Cl. 424-46.000.
Hodson, Harold Francis; and Batchelor, John Frederick, to Burroughs Wellcome Co. Method and composition to inhibit symptoms of allergy. 4,012,500, Cl. 424-46.000.
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Holden, Morell J., to Mobil Oil Corporation. Produce tray. 4,012,530, Cl. 426-124.000.

Hollander, Frank Gabriel. Tiered interlining for garments. 4,012,550, Cl. 428-190.000.
Holm, LeRoy W., to Union Oil Company of California. Micellar flooding process for recovering oil from petroleum reservoirs. 4,011,908, Cl. 166-273.000.
Holt, Jack A.; and Torbet, Philip A., to Burke Company, The. Joint clamp for joining intersecting brace members and method for making same. 4,011,638, Cl. 403-171.000.
Holton, Harry Hutchinson, to Canadian Industries, Ltd. Delignification of lignocellulosic material with an alkaline liquor in the presence of a cyclic keto compound. 4,012,280, Cl. 162-65.000.
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Ishigaki, Yoshio; Tsuchiya, Takao; and Niimura, Tsutomu, to Sony Corporation. Apparatus for recording and/or reproducing color video signals. 4,012,771, Cl. 358-4.000.
Ishii, Akira; and Ueno, Keiichi, to Nippon Telegraph and Telephone Public Corporation. Hologram memory apparatus. 4,012,108, Cl. 350-3.500.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
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Jayne, Gerald John Joseph; Askew, Herbert Frank; and Woods, David Robert, to Edwin Cooper and Company Limited. Sulphur compounds. 4,012,331, Cl. 252-48.200.
Jen, Timothy Yu-Wen; Kaiser, Carl; and Wardell, Joe R., to Smith-Kline Corporation. α-aminoalkyl-3-(1,2-dihydroxyethyl)-4-hydroxybenzyl alcohols having β-adrenergic stimulant activity. 4,012,528, Cl. 424-330.000.
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Johnson, James L., to Xerox Corporation. Linear actuator. 4,012,780, Cl. 360-78.000.
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Jones, Eric; and Walker, John, to Imperial Chemical Industries Limited. Polymerization process. 4,012,574, Cl. 526-74.000.
Jones, Gary E.; Hart, Dean H.; and Brunka, Rueben R., to Caterpillar Tractor Co. Cab mounting device. 4,012,071, Cl. 296-35.00R.
Jones, Jeffrey A., to Chanslor-Western Oil and Development Company. Emulsion treater. 4,012,207, Cl. 55-174.000.
Jones, Robert L., to Parker-Hannifin Corporation. Cryogenic pressure regulator. 4,011,734, Cl. 62-132.000.
Josephs, Walter. Method for reclaiming variegated wastes. 4,012,219, Cl. 71-9.000.
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Karlsson, Frans Harry; and Faxen, Per Torsten, to Hykon-Patent Aktiebolag. Flushing and refilling apparatuses. 4,011,605, Cl. 4-41.000.

Karlsson, Stig Erik, to Telefonaktiebolaget L M Ericsson. Device for obtaining a jitterstable synchronization of a counter. 4,012,698, Cl. 328-63.000.

Karr, Alojzy: *See—*
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Kato, Taketoshi; and Kobayashi, Norio, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing a semiconductor integrated circuit including an insulating gate type semiconductor transistor. 4,011,653, Cl. 29-571.000.

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Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Aryl ketones and production thereof. 4,012,515, Cl. 424-267.000.

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Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-Ichi; and Tsukiura, Hiroshi, to Bristol-Myers Company. Antibiotic complex Bu 2183. 4,012,576, Cl. 536-17.000.

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Kaye, Saul; and Iverson, Robert L., to Ferro Corporation. Antibacterial agents for Gram-negative bacteria. 4,012,359, Cl. 260-45.8NE.

Kaynor, Margaret; Branning, Peter; and Nolan, Bruce, to Florida Sailing Systems, Inc. Competition sailing jacket. 4,011,824, Cl. 114-270.000.

Keane, James M., to Systems Resources Corporation. Dual mode pattern generator. 4,012,735, Cl. 340-324.0AD.

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Kehren, Engelbert W., to Texas Instruments Incorporated. Automatic pushbutton dial assembly for a subscriber telephone. 4,012,601, Cl. 179-90.00K.

Keil, John G.; and Coleman, Michael G., to Motorola, Inc. Method of fabricating multicolor light displays utilizing etch and refill techniques. 4,012,243, Cl. 148-175.000.

Keith, Jay, to Milliken Research Corporation. Yarn entanglement nozzle. 4,011,640, Cl. 28-1.400.

Kellenbenz, Rolf: *See—*
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Kennecott Copper Corporation: *See—*
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Kennedy, Carroll W. Teeth cleaning device. 4,011,616, Cl. 15-21.00R.

Kensler, Daniel L., Jr.; Kohn, Gustave K.; and Walgenbach, David D., to Chevron Research Company. Oxymethylene di-carboxylic acid esters as anti-fungal agents and animal growth promoters. 4,012,526, Cl. 424-313.000.

Kermel, Louis, to C. G. Doris. Device for laying submarine pipelines. 4,011,729, Cl. 61-112.000.

Kern, Jack L., to Xerox Corporation. Ribbon drive means. 4,011,933, Cl. 197-151.000.

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Keske, Robert G., to Standard Oil Company (Indiana). Self-bonding varnish for magnet wires comprising a combination of a polyalkylenetrimellitate imide and a polyalkylenetrimellitate ester imide. 4,012,555, Cl. 428-383.000.

Keske, Robert G.; and Stephens, James R., to Standard Oil Company (Indiana). Self-bonding varnish for magnet wires comprising a polyalkylenetrimellitate ester imide. 4,012,556, Cl. 428-383.000.

Kessler, Hyman, to United States of America, Navy. Stress relieved molded cover assembly and method of making the same. 4,011,819, Cl. 102-70.20P.

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Kichline, Thomas P.; and Kranz, Allen H., to Monsanto Company. Preparation of process cheese. 4,012,534, Cl. 426-582.000.

Kiehs, Karl; and Pommer, Ernst-Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Fungicide. 4,012,521, Cl. 424-301.000.

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Kikuchi, Kunio, to Mikuni Kogyo Kabushiki Kaisha. Inner venturi tube for carburetor. 4,012,468, Cl. 261-78.00R.

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Kimura, Yosiaki. Apparatus for making feed stuff containing bagasse, protein and yeast. 4,011,806, Cl. 99-485.000.

Kindel, Erik Lennart, to LKB-Produkter AB. Method for sectioning in a microtome at low temperature and trimming of the specimen to be sectioned. 4,012,475, Cl. 264-28.000.

King, Thomas J.: *See—*
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Kirby, William Everett; and Seymour, David Jackson, to Wharton Shipping Corporation. Swash plate. 4,011,825, Cl. 114-260.000.

Kirk, Glenn E.; and Medesha, Alfred L., to Motorola, Inc. Semiconductor package. 4,012,768, Cl. 357-72.000.

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Kirschner, Thomas J., Jr., to Thiokol Corporation. Gas generator or rocket motor with selective discrete time vs. output profiles. 4,011,720, Cl. 60-254.000.

Kitano, Yoshio; and Katsumata, Takuma. Jacketed roller for synthetic yarn spinning apparatus. 4,011,641, Cl. 28-71.300.

Kiwaki, Hisakatsu; and Okubo, Hiroshi, to Hitachi, Ltd. Car signaling system. 4,012,019, Cl. 246-34.00R.

Klein, Carlton, to New York Flameproofing Company, Inc. Multiple-line soffit system. 4,011,696, Cl. 52-39.000.

Klein, Fritz F.; and Morse, Oliver C., III, to Automatic Breathing Apparatus Co., Inc. Electronically controlled pulmonary ventilator. 4,011,866, Cl. 128-145.800.

Klein, Raymond J., to Dialoc Corporation of America. Lock device. 4,011,742, Cl. 70-305.000.

Klein, Theodore Harold, to Bell Telephone Laboratories, Incorpo-

rated. Process for producing pultruded clad composites. 4,012,267, Cl. 156-178.000.
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Knox, Kenneth L., Sr. Fuel vaporizer for internal combustion engines. 4,011,850, Cl. 123-141.000.
Knutson, Dale A.; and Patel, Kishor J., to Applied Power Inc. Proportional flow control valve. 4,011,891, Cl. 137-625.620.
Kobayakawa, Toshihiro: *See—*
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Kobel, George B.: *See—*
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Koch, Henning: *See—*
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Kodis, Robert D., to Di/An Controls, Inc. Multiple document printing system. 4,011,811, Cl. 101-93.070.
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Kogelnik, Herwig Werner; and Schmidt, Ronald Vernon. Adjustable optical switch or modulator. 4,012,113, Cl. 350-96.00C.
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Koleske, Otto, to Wilson Manufacturing Corporation. Clip. 4,011,639, Cl. 24-255.00H.
Komine, Yoshio, to Canon Kabushiki Kaisha. Motion picture camera. 4,012,135, Cl. 352-72.000.
Komiya, Osamu, to Olympus Optical Co., Ltd. Electrical apparatus for treating affected part in a coeloma. 4,011,872, Cl. 128-303.140.
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Koo, James T., to Intel Corporation. Contactless random-access memory cell and cell pair. 4,012,757, Cl. 357-24.000.
Kopacki, Adam F.; and Deatcher, John H., to Stauffer Chemical Company. Suspension-emulsion interpolymer containing tris(2-ethylhexyl) phosphate. 4,012,356, Cl. 260-30.60R.
Koppel, Gary A.: *See—*
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Koubek, Edward, to United States of America, Navy. Oxidation of refractory organics in aqueous waste streams by hydrogen peroxide and ultraviolet light. 4,012,321, Cl. 210-63.00R.
Kowalski, Slawomir, to Marotta Scientific Controls, Inc. Three port non-interflow poppet valve. 4,011,892, Cl. 137-625.660.
Kraft, Dennis W., to Bunker Ramo Corporation. Water activation and pressure equalization of electrochemical batteries. 4,012,234, Cl. 429-48.000.
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Kramer, Dennis A., to Motorola, Inc. Pay TV control system. 4,012,583, Cl. 358-84.000.
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Krohn, Wolfgang; Metzger, Karl Georg; Preiss, Michael; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Nitro-β-lactam antibiotics and processes for their preparation and use. 4,012,518, Cl. 424-271.000.
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Kruger, Wolfgang; and Hanser, Hagen. Device for fastening a wheel disc on a shaft. 4,011,737, Cl. 64-9.00A.
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Kruse, Claus A., to McGill Manufacturing Company, Inc. Shaft mounted bearing for withdrawal over burrs on shaft. 4,012,086, Cl. 308-236.000.
Ksioszk, Leo P. Self-cleaning animal kennel. 4,011,837, Cl. 119-1.000.
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Kubik, Richard S. Wheel balancing apparatus. 4,011,762, Cl. 73-484.000.
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Kumazawa, Shoji: *See—*
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Kuniyoshi, Yasunobu; Narahara, Hisaaki; and Tsuchiya, Takao, to Sony Corporation. Drop-out responsive color video reproducing apparatus. 4,012,774, Cl. 358-8.000.
Kunkle, George E., Jr. Disposable container. 4,012,471, Cl. 261-124.000.
Kuntz, Emile; and Quentin, Jean Pierre, to Rhone-Poulenc S.A. Process for extracting urea from a solution with alkenylaromatic polymers with α-ketoalhydic groups. 4,012,317, Cl. 210-24.000.
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Lang, Hermann: *See—*
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Lang-Ree, Nils, to N.P.I. Corporation. Splicer for heat cohering belts. 4,012,274, Cl. 156-502.000.
Lang, Roger J.; and Bockhold, Lawrence J., to Spectra-Strip Corporation. Multiple twisted pair multi-conductor laminated cable. 4,012,577, Cl. 174-27.000.
Langford, Frederic E., to Formac International Inc. Method and apparatus for guying a load bearing member. 4,011,694, Cl. 52-1.000.
Langhammer, Jurgen: *See—*
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La Rochelle, John H.: *See—*
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Larson, Clayton E.; and Lemp, Edwin H., to White Metal Rolling & Stamping Corporation. Stability stepladders. 4,011,926, Cl. 182-107.000.
Latham, David Dennis, to Deere & Company. Combined engine and muffler compartment. 4,011,849, Cl. 123-198.00E.
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Laursen, Arne, to Slagteriernes Forskningsinstitut. Apparatus for treating an animal carcass. 4,011,629, Cl. 17-17.000.
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Law, Wendell A.; Barrett, William G.; Priebe, Norman F.; and Wise, Harry D., to Sperry Rand Corporation. Communication multiplexer module. 4,012,719, Cl. 340-172.500.
Law, Wendell A.: *See—*
Young, Clarence R.; Law, Wendell A.; Barrett, William G.; Priebe, Norman F.; and Wise, Harry D., 4,012,718.
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Lawson, Billy D.: *See—*
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Layne, Gilbert S.; and Huml, James O., to Dow Chemical Company, The. Preparation of metal fluorides. 4,012,493, Cl. 423-489.000.
Lazarus, Jonathan D., to American Broadcasting Companies, Inc. Broadcast market survey data storage and retrieval system and method. 4,012,132, Cl. 353-25.000.
Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique. Read-only integrated magnetic head. 4,012,782, Cl. 360-123.000.
Lazzery, Angelo Gino, to RCA Corporation. Liquid crystal module. 4,012,117, Cl. 350-160.0LC.
Leach, James A. Cap shape preserving device. 4,011,973, Cl. 223-84.000.
Lear Siegler, Inc.: *See—*
Harbin, Frank; and Slater, Harry W., 4,011,903.
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Lederman, Steven N., to Lederman's Incorporated. Outdoor bean bag. 4,011,611, Cl. 5-361.00B.
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Lederman, Steven N., 4,011,611.
Lee, John J., to Filac Corporation. Calibrated blood pressure measuring system and method. 4,011,860, Cl. 128-2.05M.
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Lehr, Siegfried R.; and Schaudig, Alfred. Medical electrodes. 4,011,875, Cl. 128-418.000.
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Leister, Harry M.: *See—*
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Lemelson, Jerome H. Pressure forming apparatus. 4,012,188, Cl. 425-373.000.
Lemelson, Jerome H. Magnetic transducing apparatus for using both endless loop cartridges and reel-to-reel cassettes. 4,012,790, Cl. 360-94.000.
Lemkey, Franklin D., to United Technologies Corporation. Ductile eutectic superalloy for directional solidification. 4,012,241, Cl. 148-32.000.
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Lemos, Fred R., to United States of America, National Aeronautics and Space Administration. Metallic hot wire anemometer. 4,011,756, Cl. 73-204.000.
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Lenz, Richard R. Transportable ground spraying device. 4,011,994, Cl. 239-287.000.
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Leshem, Matatjahu. Magazine-loading device for grenade launchers. 4,011,794, Cl. 89-47.000.
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Leshkowitz, Victor. 10½ Inch tape reel adaptor. 4,012,789, Cl. 360-90.000.
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Maciejewski, Kurt, 4,012,743.
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Liebig, Heinrich. Expandable dowel. 4,011,786, Cl. 85-74.000.
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Lifshits, Viktor Senderovich; Baranov, Vladimir Nikitich; Shklyanov, Llonid Pavlovich; Brjukvina, Olimpiada Mikhailovna; Osinskaya, Tamila Iosifovna; Dergachev, Nikolai Makarovich; Pevnev, Arkady Alexeevich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; and Khomenko, Vladimir Ivanovich. Machine for the resistance butt welding of pipes by fusion. 4,012,619, Cl. 219-101.000.
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Lindroth, David P.: *See*—
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Lindsay Manufacturing Company: *See*—
Meis, Charles H.; Siekmeier, David A.; and Zimmerer, Arthur L., 4,011,990.
Lindsey, Joseph W., to Arbrook, Inc. Medical fluids container. 4,012,472, Cl. 261-124.000.
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Kindel, Erik Lennart, 4,012,475.
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Long, Walter J.; Wysocki, Lawrence E.; and Wohlhieter, George M., to Everett/Charles, Inc. Combined test clip and component extraction tool. 4,012,097, Cl. 339-45.00M.
Loomba, Yogendra Singh, to Allied Chemical Corporation. Seat belt buckle switch assembly having self cleaning contacts. 4,012,612, Cl. 200-61.58B.
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Lorenz, Hans-Jochim, to Stakupress Gesellschaft fur Stahlund Kunststoffverarbeitung mbH & Co. KG. Three-point safety belt, more particularly for children. 4,012,073, Cl. 297-389.000.
Losehand, Reinhard; Welsch, Wolfgang; and Veith, Werner, to Siemens Aktiengesellschaft. Signal plate for an electric storage tube of high writing speed. 4,012,660, Cl. 313-391.000.
Losi, Salvatore; LaLanne, Pierre; Henzi, Rene; and Marka, Erwin, to Oxy Metal Industries Corporation. Gold sulfite baths containing organophosphorous compounds. 4,012,294, Cl. 204-43.00G.
Loty, Charles, to Commissariat a l'Energie Atomique. Slit-scanning image converter tube. 4,012,657, Cl. 313-99.000.
Louisell, William H.: *See*—
McKnight, William B.; Scully, Marlan O.; and Louisell, William H., 4,012,640.
Love Company: *See*—
Neal, Archie; and Moore, Paul, 4,011,916.
Love, Fred Everett: *See*—
Chelland, Joseph John; and Love, Fred Everett, 4,012,348.
Loveless, Frederick C., to Uniroyal Inc. Titanate ester cure of unsaturated elastomers. 4,012,567, Cl. 526-48.000.
Lowe, Christopher Robin: *See*—
Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin, 4,012,283.
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Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin, 4,012,570.
Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin, 4,012,571.
Dean, Peter Duncan Goodearl; and Lowe, Christopher Robin, 4,012,572.
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Lucas Industries Limited: *See*—
Smith, Trevor Stanley, 4,011,716.
Luger, Paul P., to Pioneer Educational Society, The. Chemical reaction and production systems with a spectro-optical digitizer. 4,012,199, Cl. 23-253.00A.
Luh, Bing Yu: *See*—
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., 4,012,383.
Luhman, Robert A.: *See*—
Bettenhausen, Larry A.; Casey, James H.; and Luhman, Robert A., 4,011,977.
Luke, Robert R.; and Fisher, Edmund A., to Cameron Iron Works, Inc. Pipe connector. 4,012,059, Cl. 285-18.000.
Lummus Company, The: *See*—
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Lund, Roger Edward: *See*—
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Lundquist, David E.: *See*—
Brown, Michael K.; Lundquist, David E.; Bullis, Leonard P.; and McGregor, Arvin D., 4,012,745.
Lundskow, Luke G.; Jaarsma, Robert J.; and Clay, Bobby J., to Natmar, Inc. Apparatus for applying thermoactivatable adhesive coated labels. 4,012,277, Cl. 156-571.000.
Lunquist, Frank C., to Medtronic, Inc. Antishock, insulated connector. 4,012,103, Cl. 339-111.000.
Lunts, Lawrence Henry Charles; and Collin, David Trevor, to Allen & Hanburys Limited. 5-[1-Hydroxy-2-(1-methyl-3-phenylpropyl-)aminoethyl] salicylamide and physiologically acceptable acid addition salts thereof. 4,012,444, Cl. 260-559.00S.
Lupkes, Wilhelm F. Paint-applying device. 4,012,152, Cl. 401-218.000.
Lussiez, Guy W., to Amax Inc. Chromite recovery from chromite-bearing ore. 4,012,484, Cl. 423-53.000.
Luttbeg, Leonard M.: *See*—
Fogel, Danny L.; and Luttbeg, Leonard M., 4,011,671.
Lyman, George F.; and Lowry, Alan, to Data Packaging Corporation. Tissue culture cluster dish. 4,012,288, Cl. 195-139.000.
Lynk, Charles Nelson, Jr.; and Mikulski, James Joseph, to Motorola, Inc. Transmission trunk multichannel dispatch system with priority queuing. 4,012,597, Cl. 179-41.00A.
M. L. Engineering (Plymouth) Limited: *See*—
Moorey, Ernest James, 4,012,645.
M & T Chemicals Inc.: *See*—
Freiman, Aaron, 4,012,503.
Gitlitz, Melvin H.; and Freiman, Aaron, 4,012,347.
Ma, Kwok Chuen. Fortune cookie machine. 4,012,184, Cl. 425-112.000.
Macander, Antoni: *See*—
Orshitzer, Philip; and Macander, Antoni, 4,012,341.
MacDonald, Paul M., to PX Industries, Inc. Corner protector for strapped stacks. 4,011,632, Cl. 24-16.00R.
MacDougall, David L., Jr., to Shugart Associates, Inc. Magnetic recording playback circuit. 4,012,785, Cl. 360-43.000.
MacGregor International S.A.: *See*—
Hopland, Moritz, 4,011,900.
Maciejewski, Kurt, to Licentia Patent-Verwaltungs-G.m.b.H. Antenna system including a paraboloidal reflector and an exciter. 4,012,743, Cl. 343-781.00R.
Macriss, Robert A.; Rush, William F.; and Weil, Sanford A., to Gas Developments Corporation. Air cleaning adsorption process. 4,012,206, Cl. 55-34.000.
Madacsi, John P.: *See*—
Knoepfler, Nestor B.; Madacsi, John P.; and Neumeyer, Julius P., 4,012,507.

Maeda, Takeo: *See*—
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Maffei, Raymond L. Extraction and cleaning processes. 4,012,194, Cl. 8-142.000.

Magee, Donald L.; Bailey, Walter A.; and Bailey, Roger P. Method and apparatus for filament winding on a corrugated form to produce a cylindrical corrugated glass fiber part. 4,012,266, Cl. 156-173.000.

Magnatex Limited: *See*—
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Magyar Tudomanyos Akademia Atommag Kutato Intezete: *See*—
Szalay, Sandor; and Samsoni, Zoltan, 4,012,220.

Mailly, Pierre Philippe Louis: *See*—
Chabannes, Francois Marie Maurice; Milot, Edouard Sylvain; Godfrin, Pierre Raymond Louis; and Mailly, Pierre Philippe Louis, 4,012,145.

Mains, Harold E.: *See*—
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Makiyama, Muneto; Yasumoto, Taizo; Kumazawa, Shoji; Murata, Shoichi; and Miya, Shiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Acrylic synthetic fibers having an animal hair-like touch and its method of manufacture. 4,012,346, Cl. 260-17:00A.

Malacheski, Joseph J. Clip construction. 4,011,636, Cl. 24-137.00R.

Malacheski, Joseph J. Door lock. 4,012,064, Cl. 292-169.180.

Malk, Marvin I., to Imperial Caps, Inc. Adjusting device for hat with sweat band. 4,011,600, Cl. 2-183.000.

Mancini, Joseph H.: *See*—
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Manitowoc Company, Inc., The: *See*—
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Mao, Daniel: *See*—
Mouille, Rene Louis; Coffy, Rene Louis; Hancart, Michel Aime; and Mao, Daniel, 4,012,169.

Marancik, William G., to Airco, Inc. Surface joining by bonding of metal and deposited metal. 4,011,982, Cl. 228-208.000.

Marantette, Ruth B.: *See*—
Marantette, William F.; and Marantette, Ruth B., 4,012,148.

Marantette, William F.; and Marantette, Ruth B. Projection scope and positioning system. 4,012,148, Cl. 356-172.000.

Marathon Oil Company: *See*—
Hayes, John B.; Haws, Gerald W.; and Gogarty, William B., 4,012,329.
Rhudy, John S.; Gogarty, William B.; Knight, Bruce L.; and Fullinwider, James H., 4,011,910.

Marchand, Jean, to Glaverbel-Mecaniver S.A. Apparatus for the production or treatment of flat glass. 4,012,216, Cl. 65-99.00A.

Marconi Company Limited, The: *See*—
Chambers, John Philip; and Wright, Derek Thomas, 4,012,772.

Marek, James R.; and Zunick, Michael J., to McGraw-Edison Company. Fusible element for electrical apparatus. 4,012,707, Cl. 337-27.000.

Marek, Miroslav; Toman, Ludek; and Pecka, Jan, to Ceskoslovenska akademi ved. Method of radiation polymerization and copolymerization of isobutylene by a cationic mechanism. 4,012,304, Cl. 204-159.240.

Margotte, Dieter: *See*—
Reiff, Gunther; Margotte, Dieter; Idel, Karstel; Vernaleken, Hugo; and Freitag, Dieter, 4,012,362.

Marion Laboratories, Inc.: *See*—
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Marka, Erwin: *See*—
Losi, Salvatore; LaLanne, Pierre; Henzi, Rene; and Marka, Erwin, 4,012,294.

Markos, Charles S.; and Yen, Chung H., to G. D. Searle & Co. 2-[5-(cyclic amino) ethyl-10,11-dihydro-5H-dibenzo[a,d]-cycloheptene-5- yl]-5-alkyl-1,3,4-oxadiazoles and congeners. 4,012,393, Cl. 260-293.540.

Marotta Scientific Controls, Inc.: *See*—
Kowalski, Slawomir, 4,011,892.

Marshall, Lawrence E., to McDonnell Douglas Corporation. Aircraft flight controller. 4,012,014, Cl. 244-83.00F.

Martin, David James Reginald, to Coal Industry (Patents) Limited. Communication system between a transmitter, receiver station and a mobile station utilizing unidirectional amplifiers between parallel radiated transmission lines. 4,012,662, Cl. 325-28.000.

Martin, Ernest Newell. Material dispenser. 4,011,969, Cl. 222-196.000.

Martin, Fred David: *See*—
Adams, Sally Lee; Martin, Fred David; and Cook, Michael M., 4,011,909.
Boothe, Jerry Emile; and Martin, Fred David, 4,012,327.

Martin, Rodney O.; and Whitman, John C., to Agway, Inc. Barn cleaner scraper. 4,011,618, Cl. 15-93.00R.

Martinson, Milton; and Michelson, Ernest C. Bearing puller device. 4,011,648, Cl. 29-264.000.

Martz, Lyle F.; and Nanz, John W., to Westinghouse Electric Corporation. Blower system and control system therefor. 4,011,735, Cl. 62-186.000.

Maruyama, Isamu: *See*—
Katsube, Junki; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; Takayama, Masaharu; Ono, Keiichi; Katayama, Shigenari; Tanaka, Yoshihiro; Inaba, Shigeho; and Yamamoto, Hisao, 4,012,514.
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Marwell, Edward M.: *See*—
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Masi, Paolo: *See*—
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Mason, Clifford A.: *See*—
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Mason, Edward M.: *See*—
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Massachusetts Institute of Technology: *See*—
Flemings, Merton C.; and Young, Kenneth P., 4,011,901.
Gatos, Harry C.; and Lagowski, Jacek, 4,011,745.

Massey, John P. Sorting machines. 4,011,935, Cl. 198-365.000.

Mast, Aquila D., to Sperry Rand Corporation. Bale actuated control for the rear roll forming chamber in a crop material roll forming machine. 4,011,711, Cl. 56-341.000.

Masterson, Earl E., to Honeywell Inc. Microscope object slide positioning system. 4,012,111, Cl. 350-90.000.

Masterson, Earl E., to Honeywell Inc. Microscope stage positioning system. 4,012,112, Cl. 350-90.000.

Masuda, Senichi. Electrostatic powder painting apparatus. 4,011,991, Cl. 239-15.000.

Matare, Herbert F., to International Rectifier Corporation. Liquid epitaxy technique. 4,012,242, Cl. 148-172.000.

Matovich, Mitchel J., Jr., to Nolex Corporation. Carton blank, carton and method of forming carton. 4,011,984, Cl. 229-37.00R.

Matsuda, Kazuo; Ohmura, Hidemasa; and Aritaki, Hirakazu, to Kao Soap Co., Ltd. Process for preparing non-ionic polyurethane emulsions. 4,012,349, Cl. 260-29.2TN.

Matsuda, Yasuo; Maeda, Takeo; Watanabe, Kouzou; Honda, Kazuo; Okuda, Hironori; Miyashita, Kunio; and Sugiura, Yasuyuki, to Hitachi, Ltd. Method and apparatus for controlling the operation of synchronous motor. 4,012,679, Cl. 318-167.000.

Matsukawa, Hiroharu: *See*—
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Matsuno, Isao: *See*—
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Matsushita, Toshiaki: *See*—
Sato, Tadanori; Matsushita, Toshiaki; and Matsuno, Isao, 4,011,841.

Mattel, Inc.: *See*—
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Matyas, Andrew M. Building wall constructions. 4,011,702, Cl. 52-387.000.

Mauvernay, Yves; and Zberg, Franz, to S.A.S. Trading S.A. Security screw cap. 4,011,960, Cl. 215-220.000.

Maxson, Orwin G.; and Peterson, Marvin L., to Continental Oil Company. Personnel transfer gangway. 4,011,615, Cl. 14-71.100.

Mayer, Edward A.; and Plungis, Donald W., to Texaco Inc. Internal combustion engine operation utilizing exhaust gas recirculation. 4,011,845, Cl. 123-119.00A.

Mayer, James W.; Nicolet, Marc A.; and Lau, Silvanus S., to California Institute of Technology. Solid phase epitaxial growth. 4,012,235, Cl. 148-1.500.

Mayer, Richard Eugene: *See*—
Schwartz, Judd Leonard; and Mayer, Richard Eugene, 4,012,546.

Mayer, Warren C.; and Skistimas, Donald V., to Johnson & Johnson. Wet laid laminate and method of manufacturing the same. 4,012,281, Cl. 162-127.000.

Mazur, Harry E. Demountable swivel fastener with detent. 4,011,637, Cl. 24-224.0SS.

Mazur, Robert H., to G. D. Searle & Co. Anti-ulcer polypeptides containing L-aspartic acid and intermediates thereto. 4,012,367, Cl. 260-112.50R.

McCall, Samuel Leverte, Jr.: *See*—
Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, 4,012,699.

McConnell, Edmund Alexander, to Wickman Machine Tool Sales Limited. Multi spindle lathes. 4,011,777, Cl. 82-3.000.

McCullough, Glenn R.: *See*—
Bredeson, Larry D.; McCullough, Glenn R.; and Wylie, Oran L., 4,012,457.

McDonald, Dean; and Williams, Michael R., to FMC Corporation. Automatic coupling mechanism for hose reels. 4,012,002, Cl. 242-54.00R.

McDonnell Douglas Corporation: *See*—
Harris, Charles V.; Pickett, Lowell F.; and Schlanert, George A., 4,011,771.
Marshall, Lawrence E., 4,012,014.

McDowell, William J.; and Coleman, Charles F., to United States of America, Energy Research and Development Administration. Liquid film target impingement scrubber. 4,012,209, Cl. 55-240.000.

McGhie, Russell Park; and Ferraro, Joseph George, to Colgate-Palmolive Company. Collapsible containers. 4,011,968, Cl. 222-107.000.

McGill Manufacturing Company, Inc.: *See*—
Kruse, Claus A., 4,012,086.

McGraw-Edison Company: *See*—
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McGregor, Arvin D.: *See*—
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McKie, Kenneth Thomas; and Olah, Istvan Steve, to TRW Inc. Magnetic data decoder. 4,012,786, Cl. 360-45.000.

McKnight, William B.; Scully, Marlan O.; and Louisell, William H., to United States of America, Army. X-ray generator. 4,012,640, Cl. 250-493.000.

McLoughlin, Robert W.; and Nuttall, Colin P., to Gallaher Limited. Cigarette monitoring apparatus. 4,011,950, Cl. 209-73.000.

McMullen, Thomas B., to Xerox Corporation. Overcoated electrostatographic photoreceptor. 4,012,255, Cl. 96-1.500.

McNeil Corporation: *See*—
Ramazzotti, Dario J.; Thiry, Geza A.; and Genis, James, 4,012,186.

McQueary, Agnes R., to Procter & Gamble Company, The. Method of conditioning fabrics in a clothes dryer. 4,012,540, Cl. 427-242.000.

McVeigh, James H., to Xerox Corporation. Liquid crystalline platen for an electrophotographic printing machine. 4,012,122, Cl. 350-160.0LC.

McVey, Charles I.; and Uy, O. Manuel, to General Electric Company. Refractory metal oxide reflector coating on lamp envelope. 4,012,655, Cl. 313-27.000.

Meador, Richard A.: *See*—
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Measurex Corporation: *See*—
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Meckler, Gershon. Air conditioning apparatus utilizing solar energy and method. 4,011,731, Cl. 62-2.000.

Medesha, Alfred L.: *See*—
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Medishield Corporation Limited, The: *See*—
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Medtronic, Inc.: *See*—
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Meguerian, Garbis H.; Hirschberg, Eugene H.; and Rakowsky, Frederick W., to Standard Oil Company. Process for treating exhaust gas from internal combustion engine over catalyst comprising nickel, rhodium, and monolithic ceramic support. 4,012,485, Cl. 423-213.500.

Meinecke, Klaus; Wilhelm, Dieter; Coir, Leo; Tillack, Jurgen; Samulowitz, Helmut; and Gebhardt, Karl, to U.S. Philips Corporation. Method for manufacturing a sealed beamed headlight. 4,011,642, Cl. 29-25.160.

Meis, Charles H.; Siekmeier, David A.; and Zimmerer, Arthur L., to Lindsay Manufacturing Company. Center pivot irrigation system. 4,011,990, Cl. 239-11.000.

Meitzler, Allen H.: *See*—
Beaudoin, Gordon L.; Giardini, Dante S.; and Meitzler, Allen H., 4,011,654.
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Melanson, James W., to Raymond Lee Organization, Inc., The, a part interest. Grid clip apparatus for hanging pictures. 4,012,023, Cl. 248-489.000.

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Merck & Co., Inc.: *See*—
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Merkel, Paul B.: *See*—
Dickerson, Dorsey G.; and Merkel, Paul B., 4,012,260.

Merkl, George G. Process for the removal of SO_2 from a stack gas. 4,012,487, Cl. 423-242.000.

Mertz, Lester L. Convertible camper vehicle. 4,012,070, Cl. 296-27.000.

Messer Griesheim GmbH: *See*—
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Metallgesellschaft Aktiengesellschaft: *See*—
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Metzger, Karl Georg: *See*—
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Meyer, Engelbert Anthony, to USM Corporation. Retainer clip. 4,011,635, Cl. 24-73.0MF.

Meyer, Jarold A., to Chevron Research Company. Hydrocarbon hydrocracking process. 4,012,312, Cl. 208-111.000.

Meyer, Jerome Charles. Telephone communications system for the deaf. 4,012,599, Cl. 179-84.0VF.

Meyer, Roth & Pastor Maschinenfabrik GmbH: *See*—
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Meyerhoff, Robert Wagner, to Union Carbide Corporation. Method for the manufacture of AC superconducting articles. 4,012,293, Cl. 204-9.000.

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Michalak, Edwin L. Golf ball washer having scrub, clean and dry element. 4,011,619, Cl. 15-97.00R.

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Mickelson, Roger D., to FMC Corporation. Telescopic boom quick retract hydraulic circuit. 4,011,699, Cl. 52-115.000.

Mikulski, James Joseph: *See*—
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Mikuni Kogyo Kabushiki Kaisha: *See*—
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Millard, Gregory Stephen Truscott, to Borg-Warner Corporation. Heat exchangers with integral surge tanks. 4,011,905, Cl. 165-175.000.

Miller, Charles. Ski protector. 4,012,050, Cl. 280-11.380.

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Miller, Ronald J.; and Rauschelbach, Paul A., to Sperry Rand Corporation. Vertical navigation control system. 4,012,626, Cl. 235-150.260.

Milliken Research Corporation: *See*—
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Millmaster Onyx Corporation: *See*—
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Mills, Douglas A.: *See*—
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Milot, Edouard Sylvain: *See*—
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Minch, Morris L.: *See*—
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Mitchell, Howard Lee, III, to Exxon Research and Engineering Company. High surface area alpha aluminas. 4,012,337, Cl. 252-439.000.

Mitchell, Larry D.; and Mason, Edward M., to Affiliated Hospital Products, Inc. Lock valve flow control arrangement. 4,012,031, Cl. 269-325.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsubishi Rayon Co., Ltd.: *See*—
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Mitsui Mining Co.: *See*—
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Miura, Hideki, to Sony Corporation. Noise elimination circuit. 4,012,643, Cl. 307-237.000.

Miura, Masaki: *See*—
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Miya, Goro: *See*—
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Miya, Shiro: *See*—
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Miyamoto, Akio; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Method of forming color images employing desensitizing agents. 4,012,538, Cl. 427-145.000.

Miyashita, Kunio: *See*—
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Mizuma, Noriaki; and Omura, Yukikazu, to FMC Corporation. Molding process for the manufacture of shaped carbon articles. 4,012,476, Cl. 264-29.100.

Mizuno, Makoto; Nishiumi, Yoshio; and Nagasaka, Yukio, to Atom Chemical Paint Co., Ltd. Apparatus for paint application. 4,011,993, Cl. 239-214.000.

Mobil Oil Corporation: *See*—
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Company. Makeup air device for grease extraction ventilator. 4,011,802, Cl. 98-115.00K.
Monarch Marking Systems, Inc.: *See—*
Herrin, Carlos B., 4,012,716.
Monciardini, Martin: *See—*
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Baatz, James C.; and Corey, Albert E., 4,012,560.
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Montedison Fibre S.p.A.: *See—*
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Moore, Joseph E., to Chevron Research Company. Carbamoyl chlorides. 4,012,436, Cl. 260-481.00R.
Moore, Marvi D.; and Fowler, David P., to Frito-Lay, Inc. Method for conditioning food strands. 4,012,532, Cl. 426-451.000.
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Moore, Paul A. Bicycle safety device. 4,012,054, Cl. 280-239.000.
Moorey, Ernest James, to M. L. Engineering (Plymouth) Limited. Timing circuit. 4,012,645, Cl. 307-293.000.
Moosberg, Borje Sigurd, to Abu Aktiebolag. Gear wheel casing. 4,011,774, Cl. 74-606.00R.
Moran, Thomas M.; and Paskert, Joseph H., to Eaton Corporation. One piece connector for flexible conduit. 4,012,578, Cl. 174-51.000.
Morgan Construction Company: *See—*
David, Siegfried, 4,011,780.
Mori, Kenji: *See—*
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Morris, John M., to Rexnord Inc. Granular gas filter arrangement. 4,012,210, Cl. 55-479.000.
Morris, Max O. Snap lock connector for components such as knockdown furniture components. 4,012,155, Cl. 403-290.000.
Morrow, James G., Sr.; and Pech, David J., to Manitowoc Company, Inc., The. Sea crane tiedown. 4,011,955, Cl. 212-3.000.
Morse, Oliver C., III: *See—*
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Mostofin, Alexei Alexeevich; and Sorokina, Nina Sergeevna. Feed water and condensate sample analyzer for power plants. 4,012,278, Cl. 159-30.000.
Motl, Daniel M.: *See—*
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Lehner, Leo L.; and Segerson, Eugene E., 4,012,765.
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Mott, Roger Eugene; and Bichel, Darwin Carl, to Deere & Company. Harvesting platform. 4,011,709, Cl. 56-10.400.
Mouille, Rene Louis; Coffy, Rene Louis; Hancart, Michel Aime; and Mao, Daniel, to Societe Nationale Industrielle Aerospatiale. Rotor for rotating wing type aircraft. 4,012,169, Cl. 416-134.00A.
Moyer, Richard E., to Synchro Systems, Inc. Apparatus for drying fabrics. 4,011,663, Cl. 34-155.000.
Mrdjen, Peter, to Xerox Corporation. Luminescent screen laser scanning technique. 4,012,776, Cl. 358-75.000.
Mueller, Hans: *See—*
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Muhe, Barbara: *See—*
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Lang-Ree, Nils, 4,012,274.
Naarmann, Herbert; and Pohlemann, Heinz, to BASF Aktiengesellschaft. Polymers containing hydroxamic acid-o-sulfonyl groups. 4,012,366, Cl. 260-79.700.
Nagasaka, Yukio: *See—*
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Nakamura, Zenzo; Tsunekawa, Tokuichi; Ohtaki, Shohei; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Electronic flash device with capacitor discharge cut-off before full discharge. 4,012,665, Cl. 315-241.00P.
Nakao, Masaru: *See—*
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NCR Corporation: *See—*
Miller, Robert E.; Brown, Robert W.; and Phillips, Paul S., Jr., 4,012,554.
Neal, Archie; and Moore, Paul, to Love Company. Chisel plow mount. 4,011,916, Cl. 172-710.000.
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Nelligan, William B., to Schlumberger Technology Corporation. System for telemetering well logging data. 4,012,712, Cl. 340-18.0CM.
Nelson Industries, Inc.: *See—*
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Nelson, John A., to Xerox Corporation. Multiple modular sorter system. 4,012,034, Cl. 271-173.000.
Nelson, John A., to Xerox Corporation. Sorter control system. 4,012,035, Cl. 271-173.000.
Nelson, John P., to Allis-Chalmers Corporation. Axially adjustable mounting for a belt idler. 4,011,767, Cl. 74-242.15R.
Nelson, Lewis A.; and Cox, Herbert L., to Northrop Corporation. Control and synchronization of twin engines with a master throttle lever. 4,012,015, Cl. 244-83.00F.
Nelson, Norman A., to Upjohn Company, The. Process for preparing 5-oxa PGF, -type compounds. 4,012,431, Cl. 260-468.00D.
Nercessian, Sarkis, to Forbro Design Corporation. Regulated power supply for very high current with voltage and current programmable to zero. 4,012,685, Cl. 323-20.000.
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Nielsen, Robert P.; and La Rochelle, John H., to Shell Oil Company. Ethylene oxide process. 4,012,425, Cl. 260-348.50R.
Niimura, Tsutomu: *See*—
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Nilon, John W.; and King, Thomas J., to Nilon Bros. Apparatus for rapidly dispensing beer into open cups. 4,011,896, Cl. 141-82.000.
Nimerick, Kenneth H., to Dow Chemical Company, The. Composition useful in preventing environmental erosion containing film forming organic polymer and silicone. 4,012,355, Cl. 260-29.7NR.
Nippon Electric Company, Ltd.: *See*—
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Noack, Manfred G., to Olin Corporation. Catalyzed hydrazine compound corrosion inhibiting composition and use. 4,012,195, Cl. 21-2.70R.
Noble, Melvin Lee, to United Technologies Corporation. Turbomachinery vane or blade with cooled platforms. 4,012,167, Cl. 416-97.00A.
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Olson, Donald C., to Shell Oil Company. Electrochemical detection for lead alkyls. 4,012,290, Cl. 204-1.00T.
Olson, Donald C.; and Guillory, Michael P., to Shell Oil Company. Electrochemical olefin detector for gaseous streams. 4,012,291, Cl. 204-1.00T.
Olson, Wallace Fred, to Smith International, Inc. Dual conduit drill stem member. 4,012,061, Cl. 285-133.00A.
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O'Reilly, Bernard M.; and Best, James F. Device for adjusting the legs of adjustable wheelchairs. 4,012,074, Cl. 297-434.000.
O'Reilly, Bernard M.; and Best, James F. Device for adjusting the legs of adjustable wheelchairs. 4,012,075, Cl. 297-434.000.
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Owen, Hartley; and Venuto, Paul B., to Mobil Oil Corporation. Upgrading refinery light olefins with hydrogen contributor. 4,012,455, Cl. 260-668.00R.
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Parker, John Castlereagh, III. Bedpan system. 4,011,610, Cl. 5-90.000.
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Pearson, Raymond H. Electric toilet deodorizer. 4,011,608, Cl. 4-213.000.
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Pelosi, Stanford S., Jr.; and Yu, Chia-Nien, to Morton-Norwich Products, Inc. 2-[5-(3,4-Dimethoxyphenyl)-2-furyl]imidazole hydrochloride. 4,012,415, Cl. 260-309.000.

Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 2-[5-(3-Trifluoromethylphenyl)2-furyl]imidazole hydrochloride. 4,012,416, Cl. 260-309.000.

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Petrimaux, Eric; Lameyre, Felix; and Bouteille, Daniel, to La Telemechanique Electrique. Manual control device for pneumatic systems. 4,011,883, Cl. 137-110.000.

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Pfefferle, William C., to Engelhard Minerals & Chemicals Corporation. Method and apparatus for promoting combustion in an internal combustion engine using a catalyst. 4,011,839, Cl. 123-1.00R.

Pfeifer, Raymond; and Ringger, Roger. Knockdown put-together drawer. 4,012,090, Cl. 312-330.00R.

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Phillips, Alvin B.; Monciardini, Martin; Mills, Douglas A.; and Brors, Daniel, to Western Digital Corporation. Semiconductor package and method of manufacture thereof. 4,012,766, Cl. 357-70.000.

Phillips, Eugene, to General Dynamics Corporation. Method for conditioning drilled holes in multilayer wiring boards. 4,012,307, Cl. 204-192.00E.

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Phillips, Maurice L.: *See—*
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Pitt, Gillies D., to International Standard Electric Corporation. Flowmcter. 4,011,754, Cl. 73-194.0VS.

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Poore, William M.; and Heckendorf, Herbert W., to Frosty-Bite Confections. Confection making machine. 4,012,185, Cl. 425-120.000.

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Reuschel, Konrad; Rucha, Ulrich; and Schrotter, Gerhard, to Siemens Aktiengesellschaft. Bending silicon rods into U-shapes. 4,012,217, Cl. 65-102.000.
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Kuntz, Emile; and Quentin, Jean Pierre, 4,012,317.
Rhudy, John S.; Gogarty, William B.; Knight, Bruce L.; and Fullinwider, James H., to Marathon Oil Company. Polymer flooding in high permeability reservoirs. 4,011,910, Cl. 166-274.
Rhythm Watch Co. Ltd.: *See*—
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Ricard, Carl A., to Sanders Associates, Inc. AC line triggered refreshing of CRT displays. 4,012,592, Cl. 358-150.000.
Rice, Harold D. Solar energy converter and elongated Fresnel lens element. 4,011,857, Cl. 126-270.000.
Rich, Joseph W.; and Raymonda, John W., to Calspan Corporation. Method and apparatus for the initiation of chemical reactions. 4,012,301, Cl. 204-157.10R.
Richards, Ernest Levon, to Milliken Research Corporation. Dust collection mat and method of manufacture. 4,012,544, Cl. 428-95.000.
Richdel, Inc.: *See*—
Saarem, Myrl J.; and Firebaugh, Dale C., 4,012,673.
Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. Herbicidal compositions containing dioxolane substituted anilids and method therefor. 4,012,222, Cl. 71-88.000.
Rienzo, Donald D., Sr., to Allan Tackle Manufacturing Co., Inc. Line guide for a fishing rod. 4,011,680, Cl. 43-24.000.
Riewald, Paul Gordon; Krueger, William Henry; and Dhingra, Ashok Kumar, to Du Pont de Nemours, E. I., and Company. Aluminum alloy reinforced with alumina fibers and lithium wetting agent. 4,012,204, Cl. 29-191.200.
Riley, Robert E.: *See*—
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Ritter, Frederick J. Personalized message system and process. 4,011,676, Cl. 40-143.000.

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Roberti, Barney. High strength composite wood veneer articles. 4,012,548, Cl. 428-106.000.
Roberts, Earl J.: *See*—
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Roberts, Shepard D. Combination applicator-dispenser hair styler. 4,011,879, Cl. 132-9.000.
Roberts, Thomas C., to Curtiss-Wright Corporation. Sealing grid for a rotary piston mechanism. 4,012,179, Cl. 418-120.000.
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Roddy, Luke J.: *See*—
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Rodenberg, Herbert G.: *See*—
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Roepke, Wallace W.; Lindroth, David P.; and Rasmussen, Joseph W., to United States of America, Interior. Linear cutting rotary head continuous mining machine. 4,012,077, Cl. 299-76.000.
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Rogers, James Charles, to International Business Machines Corporation. Document reproduction having output means with plural outputs operable in a plurality of modes. 4,012,032, Cl. 271-64.000.
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Shachat, Norman; Haggard, Richard A.; and Lewis, Sheldon N., 4,012,437.
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Waaske, Heinz, 4,012,754.
Rollett, John Mortimer, to Post Office, The. Active amplitude equalizers. 4,012,704, Cl. 333-28.00R.
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Rosenberg, Sanders D.; and Vanderwall, Eugene M., to Aerojet-General Corporation. Gelled cryogenic liquids and method of making same. 4,011,730, Cl. 62-1.000.
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Rosendahl, Gottfried R.; and Dykes, Wiley V., to United States of America, Navy. Optical system for 360° annular image transfer. 4,012,126, Cl. 350-198.000.
Rosiere, Charles Eugene, to Marion Laboratories, Inc. Gas generating apparatus for use with culture transport and storage. 4,012,203, Cl. 23-282.000.
Ross, James J. Fluid power system. 4,011,723, Cl. 60-486.000.
Roth, Walter L.: *See*—
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Roueche, Armand; and L'Eplattenier, Francois, to Ciba-Geigy Corporation. Benzinaldazolyl-, quinolonyl-, or phenmorpholonylazo-3-cyano-4-methyl-1,2-[1',2']-benz-[4',5']-imidazolo-6-hydroxypyridine colorants. 4,012,371, Cl. 260-155.000.
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Rowland, Stanley P.: *See*—
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Rump, Bjorn S.; Johnard, Bengt; and Schlegel, Walter, to Societe d'Etudes du Procede Noridem. Method and means for providing a foamed plastic surface with a relief structure. 4,012,248, Cl. 156-79.000.
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Rybicki, Edmund F.; Wheeler, Kenneth Ray; Hulbert, Lewis E.; Karagianes, Manuel Tom; and Hassler, Craig R., to Battelle Memorial Institute. Porous expandable device for attachment to bone tissue. 4,011,602, Cl. 3-1.900.
Ryden, Howard R.; Wafer, John A.; and Slade, Paul G., to Westinghouse Electric Corporation. Latch for a circuit interrupter. 4,012,615, Cl. 200-325.000.
S.A.S. Trading S.A.: *See*—
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S.R.M. Hydromekanik Aktiebolag: *See*—
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Saarem, Myrl J.; and Firebaugh, Dale C., to Richdel, Inc. Timing valve control system. 4,012,673, Cl. 361-196.000.
Sado, Yukio, to Yoshida Kogyo Kabushiki Kaisha. Adjustable-height post assembly for ready installation on a window frame or the like. 4,011,700, Cl. 52-235.000.
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Greene, Leonard M.; and Bloch, Ramon, 4,012,713.
Safety Box Toe Company: *See*—
Greenan, Wirt G., 4,011,667.
Saigh, Philip A.; and Glueckert, Albert J., to General American Transportation Corporation. Macerator-sterilizer sewage treatment system. 4,012,322, Cl. 210-86.000.
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Saito, Shoichi, to Olympus Optical Co., Ltd. Tape cassette. 4,012,011, Cl. 242-199.000.
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Sakai, Kiyoshi; Oda, Osamu; Yusa, Takashi; Yamazaki, Mitsuo; Sasaki, Masaaki; and Sasagawa, Kazuhiko, to Sankyo Company Limited. 16,16-Dimethyl 9-oxo-11α-hydroxymethyl-15ε-hydroxyprosta-5(cis), 13(trans)-dienoic acid derivatives and process for the preparation thereof. 4,012,429, Cl. 260-468.00D.
Sakamoto, Tuneaki; and Hashimoto, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for guiding warm air obtained after cooling of an engine in a motorized two-wheeled vehicle. 4,011,921, Cl. 180-33.00R.
Sakuma, Sadatane: *See*—
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Sample, Winfield; and Cheney, Robert L., to Bell & Howell Company. Light deflection apparatus. 4,012,694, Cl. 324-97.000.
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Sanderson, James Allen; and Stavropoulos, William S., to Dow Chemical Company, The. Determination of creatine phosphokinase in body fluids. 4,012,286, Cl. 195-103.50R.
Sandner, Michael Ray: *See*—
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Sandoval, Secundino Rodriguez, to Investigaciones Tecnologicas Electromecanicas y Electronicas, S.A. Automatic record changer. 4,012,047, Cl. 274-10.00R.
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Satonaka, Koichiro, to Hitachi, Ltd. Semiconductor integrated circuit device. 4,012,764, Cl. 357-68.000.
Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, to Warner-Lambert Company. Process for preparing thiazolidinone acetic acid derivatives. 4,012,395, Cl. 260-293.680.
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Scales, Stanley R., to Hughes Tool Company. Method of finishing a steel article having a boronized and carburized case. 4,012,238, Cl. 148-6.000.
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Schade, Otto Heinrich, Jr., to RCA Corporation. Voltage regulator circuit with FET and bipolar transistors. 4,012,684, Cl. 323-8.000.
Schael, Rudi; and Kellner, Kurt. Binocular optical apparatus with adjustable interocular distance, particularly for microfilm viewers. 4,012,110, Cl. 350-75.000.
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Schmitt, Helwig. Baler with double-acting plunger. 4,011,710, Cl. 56-341.000.
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Schopflin, Gisela, to Schering Aktiengesellschaft. Drug excipient of silicone rubber. 4,012,497, Cl. 424-22.000.
Schramm, Jurgen; Witter, Klaus; and Krekow, Gerhard, to U.S. Philips Corporation. Method of and device for the removal of electrostatic charges. 4,012,666, Cl. 361-213.000.
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Selander, Stig; and Cederquist, Karl, to Selander, Stig. Process of producing pulp, for manufacture of fiberboard, in a closed backwater system. 4,012,279, Cl. 162-13.000.
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Simonds, George D., Jr., to Douglas Dynamics Corporation. Valve and pump control for a hydraulic system. 4,012,175, Cl. 417-316.000.
Simson, Walter A. Combined advertising insert and mailing envelope. 4,011,985, Cl. 229-68.00R.
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Singleton, David M., to Shell Development Company. Process for reducing the total sulfur content of Claus off-gases. 4,012,486, Cl. 423-224.000.
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Slysh, Paul, to General Dynamics Corporation. High strength composite structure. 4,012,549, Cl. 428-116.000.
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Smith, Carl H., to Auto Research Corporation. Long time period astable multivibrator circuit with independently adjustable time constants. 4,011,927, Cl. 184-26.000.
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Smith, Craig A.; and Schachner, Leonard, to Xerox Corporation. Manual sorter. 4,011,952, Cl. 211-10.000.

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Smith, Trevor Stanley, to Lucas Industries Limited. Fuel control system for gas turbine engine. 4,011,716, Cl. 60-39.28R.
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Vollmer, Karl-Otto: *See—*
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von Bebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. 2-Benzoyl-3-amino-pyridines. 4,012,397, Cl. 260-295.50A.

Von Der Kall, Gunter: *See—*
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von Fraunberg, Hans-Christof, deceased: *See—*
Buck, Gunther; Seifried, Alfred; Zettel, Albert; and von Fraunberg, Hans-Christof, deceased, 4,011,764.

Von Hessberg, Konrad: *See—*
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Von Strandtmann, Max: *See—*
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Von Strandtmann, Maximilian: *See—*
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Waaske, Heinz, to Rollei-Werke Franke & Heidecke. Photographic camera. 4,012,754, Cl. 354-212.000.

Wachsmann, Doris Beryl; and Thomas, Reginald Francis. Closure having indicating means. 4,011,829, Cl. 116-121.000.

Wachtel, Helmut: *See—*
Schmiechen, Ralph; Horowski, Reinhard; Palenschat, Dieter; Paschelke, Gert; Wachtel, Helmut; and Kehr, Wolfgang, 4,012,495.

Wada, Akira; and Karino, Kazunob, to Nippon Zeon Co., Ltd. Epoxy resin composition comprising a cyclopentadiene type resin and epoxy hardener. 4,012,458, Cl. 260-837.00R.

Wade, Peter C.; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 1-[[4-Phenyl-piperidinyl (or tetrahydropyridinyl)]alkyl]-2,6-piperidinedione and analogs. 4,012,374, Cl. 260-239.30R.

Waer, Richard Roland; and Rensin, Ernest Isaac, to International Telephone and Telegraph Corporation. Pseudonoise guidance system with spillover rejection. 4,012,737, Cl. 343-17.500.

Wafer, John A.: *See—*
Ryden, Howard R.; Wafer, John A.; and Slade, Paul G., 4,012,615.

Wagner, Eugene R., to Dow Chemical Company, The. Hypolipidemic 2-(3,5-di-tert-butyl-4-hydroxyphenyl)-(thio or sulfonyl) alkanoic acids and derivatives. 4,012,523, Cl. 424-308.000.

Wahle, Gunter, to Hauni-Werke Korber & Co., KG. Device for withdrawing tobacco from the magazine of a tobacco distributor. 4,011,876, Cl. 131-109.00R.

Wahle, Gunter; and Gomann, Jurgen, to Hauni-Werke Korber & Co., KG. Distributor for cigarette rod making machines or the like. 4,011,966, Cl. 222-55.000.

Walcer, Joseph: *See—*
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Walden, John P.: *See—*
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Walder, Robert J.: *See—*
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Walgenbach, David D.: *See—*
Kensler, Daniel L., Jr.; Kohn, Gustave K.; and Walgenbach, David D., 4,012,526.

Walke, Jr., Earl W., to Ex-Cell-O Corporation. Bottom seal horn and mandrel. 4,011,800, Cl. 93-59.0MT.

Walker, John: *See—*
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Walker, Katherine E.; and Cardarelli, Nathan F., to International Copper Research Association Inc. Slow release copper toxicant compositions. 4,012,221, Cl. 71-66.000.

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Wallace-Murray Corporation: *See—*
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Waller, Eugen; Buchler, Wolfram; Kellenbenz, Rolf; Schneider, Franz; and Schumann, Burkhard, to L. Schuler GmbH. Press with hydraulic overload safety device and ram weight counterbalancing mechanism. 4,011,809, Cl. 100-48.000.

Walrafen, George Edouard. Slit-less spectrometer. 4,012,147, Cl. 356-98.000.

Walsh, Edward N.; Jaffe, Fred; Honig, Milton L.; Shim, Kyung S.; and Brokke, Mervin E., to Stauffer Chemical Company. Method of preparing stable condensation products using a Lewis acid catalyst and products thereof. 4,012,463, Cl. 260-928.000.

Walsh, Richard J.: *See—*
Bowen, Russell H.; Clark, Allen L.; Davis, David C.; Gilbert, Walter E.; Glover, Wayne L.; Walsh, Richard J.; and Wehling, Robert G., 4,012,625.

Walter, Arthur; and Erdmann, Jurgen, to Erwin Sick Optik-Electronik. Light barrier system. 4,012,635, Cl. 250-221.000.

Wang, Richard H. S.; Pacifici, James G.; and Newland, Gordon C., to Eastman Kodak Company. Photocurable compositions containing s-aryl arylcarbothioic acid esters as photoinitiators. 4,012,302, Cl. 204-159.120.

Wang, Richard H. S.; and Pacifici, James G., to Eastman Kodak Company. Production of 5,5-bis(halomethyl)-1,3,2-dioxa-phosphorinanes. 4,012,466, Cl. 260-974.000.

Warburton, William Kingston: *See—*
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Ward, Clyde L., to United States of America, Navy. Electronic equipment enclosure. 4,012,089, Cl. 312-236.000.

Ward, Frank L.; and Carbonneau, Victor J., to Clarostat Mfg. Co., Inc. Multiple output potentiometer network. 4,012,710, Cl. 338-128.000.

Wardell, Joe R.: *See—*
Jen, Timothy Yu-Wen; Kaiser, Carl; and Wardell, Joe R., 4,012,528.

Wardell, Myron Henry, Jr.: *See—*
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Warren, Walter D., to Texas Instruments Incorporated. Automatic pushbutton dial system for a subscriber telephone. 4,012,600, Cl. 179-90.00B.

Warren, Wesley S. All purpose magnetic base drill. 4,012,162, Cl. 408-76.000.

Washio, Takaji; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Electrostatic photographic copying apparatus. 4,012,138, Cl. 355-8.000.

Washio, Takaji; Sasaki, Koichi; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Electrostatic copying apparatus having copy paper cut length control. 4,012,139, Cl. 355-13.000.

Watanabe, Kouzou: *See—*
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Water Pollution Control Corporation: *See—*
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Watson, Jack H., to United States of America, Navy. Inertial switch. 4,012,613, Cl. 200-61.080.

Watson, Robert E.: *See—*
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Covington, Wayne F.; Christopher, Chris J.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,012,725.

Watt, George W.; and Baugh, Daniel W., Jr., to Exxon Nuclear Company, Inc. Process for the preparation of uranium dioxide. 4,012,489, Cl. 423-261.000.

Watts, Tom J., to Dennison Manufacturing Company. Decorative metal film heat transfer decalcomania. 4,012,552, Cl. 428-200.000.

Waugh, Dale L., to Dayco Corporation. Endless power transmission belt. 4,011,766, Cl. 74-234.000.

Weaver, Max Allen; and Fleischer, Jean Carroll, to Eastman Kodak Company. Phthalimidyl-azo-tetrahydro-quinoline compounds. 4,012,372, Cl. 260-155.000.

Weaver, Stephen; Blackwell, Lyman L.; and Staby, Paul A., to Statitrol Corporation. Multi-element ionization chamber. 4,012,729, Cl. 340-237.00S.

Webb, Grant A., to Teleflex Incorporated. Motion transmitting remote control assembly. 4,011,770, Cl. 74-501.00R.

Weber, Abraham: *See—*
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Weber, Paul L.: *See—*
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Wedemeyer, Karlfried: *See—*
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Wehling, Robert G.: *See—*
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Weil, Sanford A.: *See—*
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Weisberg, Myron D., and Levy, Selden, to Vis-Quiz, Inc. Self-correcting answer machine. 4,011,664, Cl. 35-9.00B.

Weiss, Arnold A.; Motl, Daniel M.; and Johnston, Eugene D., to Applied Power Inc. Brake tester. 4,011,751, Cl. 73-122.000.

Weitz, Paul G., Jr.; and Lamphere, David A., to Simmonds Precision Products, Inc. Liquid density measurement system. 4,011,746, Cl. 73-32.00R.

Welch, John Alan: *See—*
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Welsch, Wolfgang: *See—*
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Wening, Richard R. Battery terminal connector and housing assembly. 4,012,104, Cl. 339-116.00C.

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Westates Space-Era Products, Inc.: *See—*
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Westendorp, Willem F., to General Electric Company. Sheet-wound transformer coils. 4,012,706, Cl. 336-84.000.

Westergren, George Alfred, to Whirlpool Corporation. Vacuum cleaner with replaceable electrical terminals. 4,012,091, Cl. 339-15.000.

Western Digital Corporation: *See—*
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Western Electric Company, Inc.: *See—*
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Westervelt, Dean C.; and Pierce, Robert E., to Westinghouse Electric Corporation. Build control for fluidized bed wire coating. 4,011,832, Cl. 118-301.000.

Westfalische Berggewerkschaftskasse: *See—*
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Whirlpool Corporation: *See—*
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Whistler, Lawrence V., Jr. Cutoff die. 4,011,781, Cl. 83-387.000.

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White, James A., to Texaco Inc. Lubricating oil additives. 4,012,408, Cl. 260-302.00A.

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White Metal Rolling & Stamping Corporation: *See—*
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Whitman, John C.: *See—*
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Whittenberger, John D., to United States of America, National Aeronautics and Space Administration. Zirconium modified nickel-copper alloy. 4,012,237, Cl. 148-2.000.

Whyte, Ian A., to Westinghouse Electric Corporation. Distribution power line communication system including a messenger wire communications link. 4,012,733, Cl. 340-310.00A.

Wickman Machine Tool Sales Limited: *See—*
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Widen, Paul Oskar Birger; Jansson, Kurt Arne Emil; and Kers, Anders Tore, to Pharmacia Aktiebolag. Plastic container and breakable sealing unit ultrasonically welded thereto. 4,011,961, Cl. 215-232.000.

Wiechert, Rudolf; Kieslich, Klaus; and Koch, Henning, to Schering Aktiengesellschaft. Novel methylene steroids. 4,012,510, Cl. 424-243.000.

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Wiley, Paul Ronald, to Bell Telephone Laboratories, Incorporated. Method and means for pulse receiver synchronization. 4,012,598, Cl. 178-69.100.

Wilhelm, Dieter: *See—*
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Wittlinger, Harold Allen, to RCA Corporation. Ground fault and neutral fault detection circuit. 4,012,668, Cl. 361-44.000.

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Wurman, Eliahu, to Dead Sea Bromine Company Ltd. Process for the manufacture of flame-resistant boards, a flame-retardant mixture and a flame-retardant bonding composition containing the same. 4,012,558, Cl. 428-411.000.

Wurscher, Horst; and Bach, Horst-Werner, to U.S. Philips Corporation. Serial printing device. 4,011,932, Cl. 197-82.000.
Wyckoff, James Kenneth, to Cubic-Western Data. Bill escrow and storage apparatus for vending machine. 4,011,931, Cl. 194-4.00C.
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Yevick, George Johannus, to Personal Communications, Inc. No glasses 3-D viewer. 4,012,116, Cl. 350-132.000.
Yip, James Kwok-Fun, to Eaton Corporation. Fluid control system utilizing pressure drop valve. 4,011,721, Cl. 60-445.000.
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Zahnradfabrik Friedrichshafen AG: *See*—
Buck, Gunther; Seifried, Alfred; Zettel, Albert; and von Fraunberg, Hans-Christof, deceased, 4,011,764.
Zaremski, Donald R.; and Krepler, Albert, to Allegheny Ludlum Industries, Inc.; and Ruthner Industrienanlagen Aktiengesellschaft. Metallic descaling system. 4,012,299, Cl. 204-141.500.
Zawadzki, Edward A.: *See*—
Conner, Jesse R.; Zawadzki, Edward A.; and Polosky, Ronald J., 4,012,320.
Zberg, Franz: *See*—
Mauvernay, Yves; and Zberg, Franz, 4,011,960.
Zelahy, John W., to General Electric Company. Method for metal bonding. 4,012,616, Cl. 219-9.500.
Zelinski, Robert P.; and Gath, Rudolph H., to Phillips Petroleum Company. Method for modifying the properties of rubbery polymers of conjugated dienes. 4,012,566, Cl. 526-48.000.
Zellner, Gertroud, administratrix: *See*—
Zellner, Hugo, deceased, 4,012,389.
Zellner, Hugo, deceased (by Zellner, Gertroud, administratrix), to Donau-Pharmazie Gesellschaft m.b.H. 2- or 3-Phenyl 1,4-disubstituted phenyl piperazines. 4,012,389, Cl. 260-268.00R.
Zenith Radio Corporation: *See*—
Palac, Kazimir, 4,012,773.
Zerres, Peter: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Joest, Herbert; and Zerres, Peter, 4,012,439.
Zettel, Albert: *See*—
Buck, Gunther; Seifried, Alfred; Zettel, Albert; and von Fraunberg, Hans-Christof, deceased, 4,011,764.
Zickel, Robert E. Supracondylar prosthetic nail. 4,011,863, Cl. 128-92.0BA.
Zimmerer, Arthur L.: *See*—
Meis, Charles H.; Siekmeier, David A.; and Zimmerer, Arthur L., 4,011,990.
Zunick, Michael J.: *See*—
Marek, James R.; and Zunick, Michael J., 4,012,707.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 22, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976	B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976	B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976	B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976	B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976	B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976	B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976	B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976	B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977	B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976	B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976	B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976	B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977	B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976	B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977	B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976	B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976	B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976	B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976	B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976	B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976	B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976	B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976	B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976	B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976	B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976	B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976	B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976	B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976	B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976	B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976	B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977	B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976	B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976	B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976	B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976	B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976	B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977	B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976	B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976	B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976	B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976	B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976	B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976	B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976	B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976	B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976	B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976	B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977	B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977	B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF MARCH, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, to CPC International Inc. Process for the enzymatic isomerization of dextrose to levulose. Re. 29,152, Cl. 195-31.00F.

Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix: *See*—
Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, Re. 29,152.

Cory, Robert P., deceased: *See*—
Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, Re. 29,152.

CPC International Inc.: *See*—
Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, Re. 29,152.

Heady, Robert E.: *See*—
Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, Re. 29,152.

McCaleb, Stanley B., to Sun Oil Company. Repulsing clays on drill bits. Re. 29,151, Cl. 175-57.000.

Monsanto Company: *See*—
Phillips, Wendell Gary, Re. 29,153.

Phillips, Wendell Gary, to Monsanto Company. Certain N-phenacyl pyridinium halides. Re. 29,153, Cl. 260-294.900.

Regency Electronics, Inc.: *See*—
Schonegg, Louis E., Re. 29,154.

Schonegg, Louis E., to Regency Electronics, Inc. Transceiver channel selector. Re. 29,154, Cl. 325-18.000.

Sun Oil Company: *See*—
McCaleb, Stanley B., Re. 29,151.

LIST OF DESIGN PATENTEES

Alvarez, Teresita, to Burlington Industries, Inc. Pantyhose. 243,641, 3-15-77, Cl. D2-6.000.

Alvarez, Teresita, to Burlington Industries, Inc. Stocking. 243,643, 3-15-77, Cl. D2-337.000.

American Optical Corporation: *See*—
Canavan, Richard W., III, 243,687.

Angeles, Frank. Lamp. 243,710, 3-15-77, Cl. D48-20.00B.

Art Specialty Company: *See*—
Haft, Howard S., 243,711.

Black and Decker Manufacturing Company, The: *See*—
Zurwelle, Donald William; Ramstrom, Lee Webber; and Markle, Stanley Alan, 243,652.

Booth, Vernard S., to Olinkraft, Inc. Box blank. 243,663, 3-15-77, Cl. D9-245.000.

Brass, Robert L. Simulated table top stage for use in performing magic tricks or the like. 243,707, 3-15-77, Cl. D34-15.00R.

Bren, J. Robert. Illuminated contact lens kit. 243,718, 3-15-77, Cl. D87-9.000.

Brown, Charles Mack. Necktie. 243,644, 3-15-77, Cl. D2-351.000.

Bruest Industries, Inc.: *See*—
Faulkner, Ernest L., 243,694.

Bunyard, Kenneth L. Airplane. 243,667, 3-15-77, Cl. D12-78.000.

Burgoyne, Thomas J. Portable cord holder. 243,654, 3-15-77, Cl. D8-358.000.

Burlington Industries, Inc.: *See*—
Alvarez, Teresita, 243,641.
Alvarez, Teresita, 243,643.

Butz, Jack R., to Ken's Pizza Parlors, Inc. Building. 243,696, 3-15-77, Cl. D25-25.000.

Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 243,687, 3-15-77, Cl. D16-65.000.

Carbary, Lloyd H. Cooking rack for use in microwave ovens or the like. 243,649, 3-15-77, Cl. D7-129.000.

Cartier, Inc.: *See*—
Durante, Alfred Joseph, 243,666.

Cavazos, Antonio M. Ear tag. 243,704, 3-15-77, Cl. D30-43.000.

Clement, Carl J.; and Stengel, Fred H., to Xerox Corporation. Key set device for encoding data. 243,700, 3-15-77, Cl. D14-40.000.

Conroy, Federico. Container to hold beverage bottles and glasses. 243,648, 3-15-77, Cl. D7-71.000.

Dallaire, Raymond. Extruded side rail for a window. 243,674, 3-15-77, Cl. D25-76.000.

Dallaire, Raymond. Extruded side rail for a window. 243,675, 3-15-77, Cl. D25-76.000.

Dallaire, Raymond. Extruded sill track insert for a window. 243,676, 3-15-77, Cl. D13-6.000.

Dallaire, Raymond. Extruded sill track for a window. 243,677, 3-15-77, Cl. D25-74.000.

Dallaire, Raymond. Extruded sill track for a window. 243,678, 3-15-77, Cl. D25-74.000.

Dallaire, Raymond. Extruded sill track for a window. 243,679, 3-15-77, Cl. D25-74.000.

Dallaire, Raymond. Extruded sill track for a window. 243,680, 3-15-77, Cl. D25-74.000.

Dallaire, Raymond. Extruded side rail for a window. 243,681, 3-15-77, Cl. D25-76.000.

Dallaire, Raymond. Extruded sill track insert for a window. 243,682, 3-15-77, Cl. D25-74.000.

Dallaire, Raymond. Extruded side rail for a window. 243,683, 3-15-77, Cl. D25-76.000.

Dallaire, Raymond. Extruded side rail for a window. 243,684, 3-15-77, Cl. D25-76.000.

Dallaire, Raymond. Extruded side rail for a window. 243,685, 3-15-77, Cl. D25-76.000.

Data Packaging Corporation: *See*—
Lyman, George F., 243,705.

Dimensionetix, Inc.: *See*—
Gruber, George S., 243,691.
Gruber, George S., 243,692.
Gruber, George S., 243,693.

Dolnar, Hubert, to Unican Security Systems, Ltd. Pull. 243,661, 3-15-77, Cl. D8-319.000.

Dow Chemical Company, The: *See*—
Hutter, Wayne Robert; and Miller, John Andrew, 243,656.

Doyel, John S. Battery-powered pump. 243,690, 3-15-77, Cl. D23-18.000.

Durante, Alfred Joseph, to Cartier, Inc. Ring. 243,666, 3-15-77, Cl. D11-34.000.

Edmark, K. William; Smith, David B.; and Pheil, Louis D., to Physio Control Corporation. Physiological monitoring device housing. 243,717, 3-15-77, Cl. D83-1.00F.

Esslinger, Robert H.: *See*—
Keyko, George; and Esslinger, Robert H., 243,688.

Estee Lauder, Inc: *See*—
Levy, Ira Howard, 243,660.

Faulkner, Ernest L., to Bruest Industries, Inc. Portable catalytic heater. 243,694, 3-15-77, Cl. D23-72.000.

Fine, Leonard, to General Electric Company. Wall plate-margin and filigree. 243,653, 3-15-77, Cl. D8-353.000.

Gamble, Tyrone. Aquarium. 243,703, 3-15-77, Cl. D30-8.000.

General Electric Company: *See*—
Fine, Leonard, 243,653.

Gietzen, James J. Combined electrical connector and adapter plug therefor. 243,698, 3-15-77, Cl. D13-24.000.

Gruber, George S., to Dimensionetix, Inc. Bathing pool. 243,691, 3-15-77, Cl. D23-55.000.

Gruber, George S., to Dimensionetix, Inc. Soaking tub. 243,692, 3-15-77, Cl. D23-55.000.

Gruber, George S., to Dimensionetix, Inc. Bath tub. 243,693, 3-15-77, Cl. D23-55.000.

Haft, Howard S., to Art Specialty Company. Lamp. 243,711, 3-15-77, Cl. D48-20.00F.

Hall, Marshall D. Golf club head. 243,706, 3-15-77, Cl. D34-5.0GH.

Hardinge Brothers, Inc.: *See*—
Lyon, Garnet R., 243,664.

Hayashi Cutlery Co., Ltd.: *See*—
Hayashi, Toru, 243,650.
Hayashi, Toru, 243,651.

Hayashi, Toru, to Hayashi Cutlery Co., Ltd. Kitchen scissors. 243,650, 3-15-77, Cl. D8-55.000.

Hayashi, Toru, to Hayashi Cutlery Co., Ltd. Dressmaker's shears. 243,651, 3-15-77, Cl. D8-57.000.

Hilfiker Pipe Co.: *See*—
Hilfiker, William K., 243,697.

Hilfiker, William K., to Hilfiker Pipe Co. Retaining wall stretcher. 243,697, 3-15-77, Cl. D25-77.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Komuro, Katsusuke; and Iwakura, Shinya, 243,668.
Humlong, Robert F., to Wald Manufacturing Company, Incorporated. Bicycle steering post. 243,670, 3-15-77, Cl. D12-118.000.
Humlong, Robert F., to Wald Manufacturing Company, Incorporated. Bicycle steering post. 243,671, 3-15-77, Cl. D12-118.000.
Hutter, Wayne Robert; and Miller, John Andrew, to Dow Chemical Company, The. Bottle or similar article. 243,656, 3-15-77, Cl. D9-53.000.
Ikeda, Matafumi, to Sharp Kabushiki Kaisha. Electronic calculating machine. 243,701, 3-15-77, Cl. D64-118.000.
Ito, Kazuo. Sewing machine. 243,686, 3-15-77, Cl. D15-68.000.
Iwakura, Shinya: *See—*
Komuro, Katsusuke; and Iwakura, Shinya, 243,668.
James, David F., to Norris Industries, Inc. Backing plate for door and drawer pulls and the like. 243,662, 3-15-77, Cl. D8-350.000.
Kabushiki Kaisha Hattori Tokeiten: *See—*
Yajima, Yozo, 243,720.
Ken's Pizza Parlors, Inc.: *See—*
Butz, Jack R., 243,696.
Keyko, George; and Esslinger, Robert H., to Quartz Timing Corporation. Combined clipboard and timer. 243,688, 3-15-77, Cl. D19-88.000.
Koch, Ulrich H.: *See—*
Matousek, Stephen; and Koch, Ulrich H., 243,655.
Komuro, Katsusuke; and Iwakura, Shinya, to Honda Giken Kogyo Kabushiki Kaisha. Automobile. 243,668, 3-15-77, Cl. D12-91.000.
Laurent, Frederic, to Timex Corporation. Combined wristwatch and bracelet. 243,665, 3-15-77, Cl. D11-12.000.
Levy, Ira Howard, to Estee Lauder, Inc. Bottle. 243,660, 3-15-77, Cl. D9-168.000.
Litton Business Systems, Inc.: *See—*
Trimnell, Edward J., 243,715.
Lyman, George F., to Data Packaging Corporation. Tissue culture flask. 243,705, 3-15-77, Cl. D24-29.000.
Lyon, Garnet R., to Hardinge Brothers, Inc. Index ring for a machine tool. 243,664, 3-15-77, Cl. D15-138.000.
Markle, Stanley Alan: *See—*
Zurwelle, Donald William; Ramstrom, Lee Webber; and Markle, Stanley Alan, 243,652.
Matousek, Stephen; and Koch, Ulrich H., to Whitey Research Tool Co. Adaptor plate. 243,655, 3-15-77, Cl. D8-354.000.
Miller, John Andrew: *See—*
Hutter, Wayne Robert; and Miller, John Andrew, 243,656.
Moore, Richard C. Combined candle and holder therefor. 243,709, 3-15-77, Cl. D48-2.000.
Morris, John Charles; Stoltz, Elmer J.; and Nyquist, Richard A., to Singer Company, The. Automatic mailing machine for moistening, sealing and stamping envelopes. 243,712, 3-15-77, Cl. D64-11.00R.
Morrison, David Jon. Soap bar. 243,713, 3-15-77, Cl. D73-1.00A.
Myers Electric Products, Inc.: *See—*
Plummer, Merle A., 243,699.
Nolan, George W., to Richton International Corporation. Display stand for necklaces or the like. 243,646, 3-15-77, Cl. D6-27.000.
Norris Industries, Inc.: *See—*
James, David F., 243,662.
Nyquist, Richard A.: *See—*
Morris, John Charles; Stoltz, Elmer J.; and Nyquist, Richard A., 243,712.
Olinkraft, Inc.: *See—*
Booth, Vernard S., 243,663.
Oord, Klaas Tiemen, to U.S. Philips Corporation. Dry shaver or similar article. 243,719, 3-15-77, Cl. D28-50.000.
Owens-Illinois, Inc.: *See—*
Plummer, James E., 243,659.
Strand, Gordon A., 243,657.
Pawsat, Carlton P., to Wald Manufacturing Company, Incorporated. Bicycle steering post. 243,672, 3-15-77, Cl. D12-118.000.
Pheil, Louis D.: *See—*
Edmark, K. William; Smith, David B.; and Pheil, Louis D., 243,717.
Physio Control Corporation: *See—*
Edmark, K. William; Smith, David B.; and Pheil, Louis D., 243,717.
Plummer, James E., to Owens-Illinois, Inc. Bottle. 243,659, 3-15-77, Cl. D9-167.000.
Plummer, Merle A., to Myers Electric Products, Inc. Combined power outlet and meter support box. 243,699, 3-15-77, Cl. D13-31.000.
Price, Benjamin W. Bottle-shaped fishing lure. 243,689, 3-15-77, Cl. D22-27.000.
Quartz Timing Corporation: *See—*
Keyko, George; and Esslinger, Robert H., 243,688.
Ramstrom, Lee Webber: *See—*
Zurwelle, Donald William; Ramstrom, Lee Webber; and Markle, Stanley Alan, 243,652.
Richards Manufacturing Company: *See—*
Treace, Daniel H.; Weil, Lowell S.; and Smith, Stephen D., 243,716.
Richton International Corporation: *See—*
Nolan, George W., 243,646.
Roux, Andries Stephanus. Metal roofing tile. 243,695, 3-15-77, Cl. D25-80.000.
Schneider, David. Display stand for rings. 243,658, 3-15-77, Cl. D6-141.000.
Schoenfeld, Alexander N., to Trans-World Display Corporation. Merchandise display module. 243,647, 3-15-77, Cl. D6-188.000.
Sharp Kabushiki Kaisha: *See—*
Ikeda, Matafumi, 243,701.
Sherman, Robert P. Butane disposable lighter. 243,702, 3-15-77, Cl. D27-42.000.
Singer Company, The: *See—*
Morris, John Charles; Stoltz, Elmer J.; and Nyquist, Richard A., 243,712.
Slack, John A., to World Carpets. Rug carousel. 243,645, 3-15-77, Cl. D6-25.000.
Smith, David B.: *See—*
Edmark, K. William; Smith, David B.; and Pheil, Louis D., 243,717.
Smith, Stephen D.: *See—*
Treace, Daniel H.; Weil, Lowell S.; and Smith, Stephen D., 243,716.
Stengel, Fred H.: *See—*
Clement, Carl J.; and Stengel, Fred H., 243,700.
Stoltz, Elmer J.: *See—*
Morris, John Charles; Stoltz, Elmer J.; and Nyquist, Richard A., 243,712.
Strand, Gordon A., to Owens-Illinois, Inc. Bottle. 243,657, 3-15-77, Cl. D9-129.000.
Timex Corporation: *See—*
Laurent, Frederic, 243,665.
Trans-World Display Corporation: *See—*
Schoenfeld, Alexander N., 243,647.
Treace, Daniel H.; Weil, Lowell S.; and Smith, Stephen D., to Richards Manufacturing Company. Great toe prosthesis. 243,716, 3-15-77, Cl. D83-1.00E.
Trimnell, Edward J., to Litton Business Systems, Inc. Retaining and protective device for intravenous infusion means. 243,715, 3-15-77, Cl. D83-1.00R.
Unican Security Systems, Ltd.: *See—*
Dolnar, Hubert, 243,661.
U.S. Philips Corporation: *See—*
Oord, Klaas Tiemen, 243,719.
van der Lely, Ary: *See—*
van der Lely, Cornelis; and van der Lely, Ary, 243,708.
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Voorhees, John L. Removable insole cushion. 243,642, 3-15-77, Cl. D2-318.000.
Wald Manufacturing Company, Incorporated: *See—*
Humlong, Robert F., 243,670.
Humlong, Robert F., 243,671.
Pawsat, Carlton P., 243,672.
Webster, William Lee. Mobile welding machine. 243,669, 3-15-77, Cl. D12-101.000.
Weil, Lowell S.: *See—*
Treace, Daniel H.; Weil, Lowell S.; and Smith, Stephen D., 243,716.
West, Norvel P. Hood ornament. 243,673, 3-15-77, Cl. D12-200.000.
Whitey Research Tool Co.: *See—*
Matousek, Stephen; and Koch, Ulrich H., 243,655.
World Carpets: *See—*
Slack, John A., 243,645.
Xerox Corporation: *See—*
Clement, Carl J.; and Stengel, Fred H., 243,700.
Yajima, Yozo, to Kabushiki Kaisha Hattori Tokeiten. Electric shaver. 243,720, 3-15-77, Cl. D28-51.000.
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Zurwelle, Donald William; Ramstrom, Lee Webber; and Markle, Stanley Alan, to Black and Decker Manufacturing Company, The. Cordless electric tool. 243,652, 3-15-77, Cl. 8-68.000.

CLASSIFICATION OF PATENTS

ISSUED MARCH 15, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8	4,011,594
16	4,011,596
68	4,011,597
	4,011,598
116	4,011,599
183	4,011,600
436	4,011,595

CLASS 3

1.5	4,011,601
1.9	4,011,602
1.91	4,011,603

CLASS 4

34	4,011,604
41	4,011,605
112	4,011,606
172.12	4,011,607
213	4,011,608

CLASS 5

81 B	4,011,609
90	4,011,610
361 B	4,011,611

CLASS 7

14.55	4,011,612

CLASS 8

34	4,012,192
42 D	4,012,193
142	4,012,194
191	4,011,613

CLASS 9

337	4,011,614

CLASS 14

71.1	4,011,615

CLASS 15

21 R	4,011,616
88	4,011,617
93 R	4,011,618
97 R	4,011,619
104.06 A	4,011,620
104.1 R	4,011,625
104.92	4,011,621
248 A	4,011,622
306 A	4,011,623
344	4,011,624

CLASS 16

129	4,011,626
	4,011,627
140	4,011,628

CLASS 17

17	4,011,629
21	4,011,630

CLASS 19

100	4,011,631

CLASS 21

2.7 R	4,012,195

CLASS 23

230 A	4,012,197
230 B	4,012,196
253 A	4,012,199
253 R	4,012,198
259	4,012,200
277 C	4,012,202
277 R	4,012,201
282	4,012,203

CLASS 24

16 PB	4,011,633
16 R	4,011,632
70 SK	4,011,634
73 MF	4,011,635
137 R	4,011,636
224 SS	4,011,637
255 H	4,011,639

CLASS 28

1.4	4,011,640
71.3	4,011,641

CLASS 29

25.16	4,011,642
159 B	4,011,643
	4,011,644
	4,011,645
191.2	4,012,204
264	4,011,648
267	4,011,649
421 R	4,011,650
424	4,011,651
455 R	4,011,652
571	4,011,653
612	4,011,654
	4,011,655
750	4,011,647
818	4,011,646

CLASS 30

30	4,011,656
337	4,011,657

CLASS 32

40 R	4,011,658

CLASS 33

203	4,011,659
379	4,011,660

CLASS 34

12	4,011,661
90	4,011,662
155	4,011,663

CLASS 35

7 R	4,011,671
9 B	4,011,664
66	4,011,665

CLASS 36

59 C	4,011,666
77 R	4,011,667

CLASS 37

43 R	4,011,668
126 AD	4,011,669
126 R	4,011,670

CLASS 40

16.2	4,011,672
23 A	4,011,673
39	4,011,674
143	4,011,676
209	4,011,675

CLASS 42

70 F	4,011,678

CLASS 43

15	4,011,679
24	4,011,680
42.11	4,011,681

CLASS 44

7 C	4,012,205

CLASS 46

21	4,011,682
25	4,011,683
77	4,011,684

CLASS 47

55	4,011,677
57.5	4,011,685

CLASS 49

68	4,011,686
70	4,011,687
139	4,011,688

CLASS 51

5 D	4,011,689
8 R	4,011,690
314	4,011,691
323	4,011,692
354	4,011,693

CLASS 52

1	4,011,694
8	4,011,695
39	4,011,696
90	4,011,697
98	4,011,698
115	4,011,699
235	4,011,700
275	4,011,701
387	4,011,702
618	4,011,703
664	4,011,707
735	4,011,704
745	4,011,705

CLASS 53

187	4,011,708

CLASS 55

34	4,012,206
174	4,012,207
223	4,012,208
240	4,012,209
479	4,012,210
485	4,012,211

CLASS 56

10.4	4,011,709
341	4,011,710
	4,011,711

CLASS 57

58.89	4,011,712

CLASS 58

23 BA	4,011,713
28 R	4,011,714

CLASS 59

85	4,011,715

CLASS 60

39.28 R	4,011,716
	4,011,717
39.31	4,011,718
202	4,011,719
254	4,011,720
445	4,011,721
465	4,011,722
486	4,011,723
567	4,011,724
624	4,011,725

CLASS 61

16	4,011,726
72.4	4,011,727
86	4,011,728
112	4,011,729

CLASS 62

1	4,011,730
2	4,011,731
28	4,012,212
55	4,011,732
59	4,011,733
132	4,011,734
186	4,011,735
260	4,011,736

CLASS 64

9 A	4,011,737

CLASS 65

13	4,012,213
34	4,012,214
66	4,012,215
99 A	4,012,216
102	4,012,217
135	4,012,218

CLASS 66

14	4,011,738

CLASS 68

181 R	4,011,739

CLASS 70

58	4,011,740
107	4,011,741
305	4,011,742

CLASS 71

9	4,012,219
11	4,012,220
66	4,012,221
88	4,012,222
90	4,012,223
105	4,012,224
106	4,012,225

CLASS 72

12	4,011,743
57	4,011,744

CLASS 73

23	4,011,745
32 R	4,011,746
67.5 R	4,011,747
67.6	4,011,748
67.7	4,011,750
71.6	4,011,749
122	4,011,751
189	4,011,752
194 A	4,011,753
	4,011,755
194 VS	4,011,754
204	4,011,756
229	4,011,757
393	4,011,758
407 R	4,011,759
421.5 R	4,011,760
462	4,011,761
484	4,011,762

CLASS 74

100 R	4,011,763
193	4,011,765
234	4,011,766
242.15 R	4,011,767
479	4,011,768
	4,011,769
499	4,011,764
501 R	4,011,770
522	4,011,771
552	4,011,772
	4,011,773
606 R	4,011,774
732	4,011,775
789	4,011,776

CLASS 75

38	4,012,226
122	4,012,227
134 C	4,012,228
171	4,012,229
212	4,012,230

CLASS 81

186	4,011,778

CLASS 82

3	4,011,777

CLASS 83

71	4,011,779
167	4,011,780
387	4,011,781
471.3	4,011,782
846	4,011,783

CLASS 84

1.01	4,011,784

CLASS 85

10 R	4,011,785
74	4,011,786
76	4,011,787

CLASS 89

33 C	4,011,788
41 EA	4,011,789
47	4,011,794
162	4,011,790

CLASS 90

11 D	4,011,791
11 R	4,011,792
12.5	4,011,793

CLASS 91

286	4,011,795
488	4,011,796

CLASS 92

186	4,011,797

CLASS 93

35 R	4,011,798
53 SD	4,011,799
59 MT	4,011,800

CLASS 96

1 PC	4,012,251
1 PE	4,012,252
1 PS	4,012,250
1.5	4,012,253
	4,012,254
	4,012,255
35.1	4,012,256
36.4	4,012,257
55	4,012,258
56.5	4,012,259
114.1	4,012,260

CLASS 98

40 D	4,011,801
115 K	4,011,802
	4,011,803

CLASS 99

421 H	4,011,804
467	4,011,805
485	4,011,806

CLASS 100

2	4,011,807
26	4,011,808
48	4,011,809
229 A	4,011,810

CLASS 101

93.07	4,011,811
176	4,011,812
288	4,011,813
	4,011,814

CLASS 102

20	4,011,815
27 R	4,011,816
38	4,011,817
56 R	4,011,818
70.2 P	4,011,819

CLASS 104

97	4,011,820

CLASS 106

15 R	4,012,261
38.22	4,012,262
52	4,012,263
89	4,012,264
122	4,012,265
288 B	4,012,231
308 B	4,012,232

CLASS 108

156	4,011,821

CLASS 110

28 R	4,011,822

CLASS 112

80	4,011,823

CLASS 114

65 A	4,011,826
222	4,011,827
260	4,011,825
270	4,011,824

CLASS 116

70	4,011,828
121	4,011,829

CLASS 118

60	4,011,830
	4,011,831
301	4,011,832
323	4,011,833
652	4,011,835
653	4,011,834

CLASS 119

1	4,011,836
	4,011,837
14.08	4,011,838

CLASS 123

1 R	4,011,839
3	4,011,840
32 B	4,011,841
61 R	4,011,842
119 A	4,011,845
	4,011,846
119 E	4,011,843
119 F	4,011,844
134	4,011,847
136	4,011,848
141	4,011,850
146.5 A	4,011,851
188 S	4,011,852
198 E	4,011,849

CLASS 124

87	4,011,853

CLASS 126

270	4,011,854
	4,011,855
	4,011,857
271	4,011,856
	4,011,858

CLASS 128

2 C	4,011,859
2.05 M	4,011,860
2.06 E	4,011,861
58	4,011,862
92 BA	4,011,863
140 N	4,011,864
142.3	4,011,865
145.8	4,011,866
204	4,011,867
218 P	4,011,868
276	4,011,869
	4,011,870
284	4,011,871
303.14	4,011,872
326	4,011,873
362	4,011,874
418	4,011,875

CLASS 131

109 R	4,011,876
187	4,011,877

CLASS 132

7	4,011,878
9	4,011,879

CLASS 134

75	4,012,233

CLASS 135

1 C	4,011,880
20 M	4,011,881

CLASS 137

15	4,011,882
110	4,011,883
202	4,011,884
267	4,011,885
492.5	4,011,886
608	4,011,887
612.1	4,011,888
614.11	4,011,889
625.4	4,011,890
625.62	4,011,891
625.66	4,011,892

CLASS 138

43	4,011,893
46	4,011,894

CLASS 139

384 B	4,011,895

CLASS 141

82	4,011,896
207	4,011,897

CLASS 148

1.5	4,012,235
	4,012,236
2	4,012,237
6	4,012,238
6.3	4,012,239
11.5 C	4,012,240
32	4,012,241
172	4,012,242
175	4,012,243

CLASS 149

19.3	4,012,244
19.4	4,012,245
47	4,012,246

CLASS 150

35	4,011,898

CLASS 152

361 R	4,011,899

CLASS 156

71	4,012,247
79	4,012,248
167	4,012,249
173	4,012,266
178	4,012,267
200	4,012,268

251 4,012,269
306 4,012,270
423 4,012,271
429 4,012,272
490 4,012,273
502 4,012,274
515 4,012,275
558 4,012,276
571 4,012,277

CLASS 159

30 4,012,278

CLASS 160

188 4,011,900

CLASS 162

13 4,012,279
65 4,012,280
127 4,012,281

CLASS 164

4 4,011,901
314 4,011,902

CLASS 165

27 4,011,903
108 4,011,904
175 4,011,905

CLASS 166

105 4,011,906
241 4,011,907
273 4,011,908
293 4,011,909

CLASS 169

29 4,011,911

CLASS 171

101 4,011,912

CLASS 172

42 4,011,913
126 4,011,914
265 4,011,915
710 4,011,916

CLASS 174

27 4,012,577
42 4,012,581
4,012,582
51 4,012,578
52 PE 4,012,579
53 4,012,580

CLASS 175

57 Re.29,151
107 4,011,917
325 4,011,918

CLASS 176

87 4,012,282

CLASS 178

18 4,012,588
50 4,012,589
58 R 4,012,590
69.1 4,012,591
4,012,598
71 R 4,012,593

CLASS 179

2 DP 4,012,594
15 AS 4,012,595
41 A 4,012,596
4,012,597
84 VF 4,012,599
90 B 4,012,600
90 D 4,012,602
90 K 4,012,601
121 C 4,012,604
170.6 4,012,603
180 4,012,605

CLASS 180

1 R 4,011,919
6.48 4,011,920
33 R 4,011,921

CLASS 181

57 4,011,922
114 4,011,923
121 4,011,924
131 4,011,925

CLASS 182

107 4,011,926

CLASS 184

26 4,011,927

CLASS 187

29 R 4,011,928

CLASS 188

268 4,011,929

CLASS 192

113 B 4,011,930

CLASS 194

4 C 4,011,931

CLASS 195

31 F Re.29,152
66 R 4,012,283
80 R 4,012,284
103.5 R 4,012,285
4,012,286
4,012,287
139 4,012,288

CLASS 197

82 4,011,932
151 4,011,933
154 4,011,934

CLASS 198

365 4,011,935
517 4,011,936
4,011,937
824 4,011,938
840 4,011,939

CLASS 200

16 D 4,012,608
18 4,012,606
38 D 4,012,607
50 AA 4,012,609
4,012,610
61.08 4,012,613
61.45 R 4,012,611
61.58 B 4,012,612
144 AP 4,012,614
325 4,012,615

CLASS 203

51 4,012,289

CLASS 204

1 T 4,012,290
4,012,291
2 4,012,292
9 4,012,293
43 G 4,012,294
72 4,012,295
98 4,012,296
99 4,012,297
105 R 4,012,298
141.5 4,012,299
157.1 H 4,012,300
157.1 R 4,012,301
159.12 4,012,302
159.17 4,012,303
159.24 4,012,304
162 R 4,012,305
163 R 4,012,306
192 E 4,012,307
195 F 4,012,308
297 W 4,012,309
305 4,012,310

CLASS 206

1.5 4,011,940
5.1 4,011,941
44 R 4,011,943
45.14 4,011,942
223 4,011,945
284 4,011,946
363 4,011,947
507 4,011,948
532 4,011,949
557 4,011,944

CLASS 208

8 4,012,311
111 4,012,312
139 4,012,313
251 R 4,012,314
253 4,012,315

CLASS 209

10 4,012,316
73 4,011,950

CLASS 210

24 4,012,317
28 4,012,318
44 4,012,319
45 4,012,320
63 R 4,012,321
86 4,012,322
232 4,012,323
500 M 4,012,324
516 4,012,325

CLASS 211

10 4,011,952
13 4,011,953
14 4,011,954
71 4,011,951

CLASS 212

3 4,011,955

CLASS 214

63 4,011,956
82 4,011,957
84 4,011,958
762 4,011,959

CLASS 215

220 4,011,960
232 4,011,961
334 4,011,962

CLASS 219

9.5 4,012,616
10.55 B 4,012,617
52 4,012,618
101 4,012,619
121 EM 4,012,620
146 4,012,621

CLASS 220

9 LG 4,011,963
69 4,011,964

CLASS 221

40 4,011,965

CLASS 222

55 4,011,966
70 4,011,967
107 4,011,968
196 4,011,969
321 4,011,970
399 4,011,971

CLASS 223

84 4,011,973

CLASS 224

42.1 B 4,011,974

CLASS 226

2 4,011,975
8 4,011,976
88 4,011,977
142 4,011,978

CLASS 228

49 4,011,979
180 R 4,011,980
208 4,011,981
4,011,982

CLASS 229

14 BE 4,011,983
37 R 4,011,984
68 R 4,011,985

CLASS 233

1 A 4,011,972

CLASS 234

47 4,011,986

CLASS 235

88 N 4,011,987
92 C 4,012,624
92 FL 4,012,623
92 PK 4,012,622
150.26 4,012,626
152 4,012,627
153 AC 4,012,625
156 4,012,628

CLASS 236

34.5 4,011,988

CLASS 237

59 4,011,989

CLASS 239

11 4,011,990
15 4,011,991
135 4,011,992
214 4,011,993
287 4,011,994
404 4,011,995
491 4,011,996
556 4,011,997

CLASS 240

2.1 4,012,632
6.4 W 4,012,629
10 R 4,012,630
10 T 4,012,631

CLASS 241

55 4,011,998
79.1 4,011,999
290 4,012,000

CLASS 242

54 R 4,012,001
4,012,002
55 4,012,003
4,012,005
55.19 A 4,012,006
55.19 R 4,012,004
55.54 4,012,007
107 4,012,008
118.62 4,012,009
129.8 4,012,010
199 4,012,011

CLASS 244

1 R 4,012,012
53 B 4,012,013
83 F 4,012,014
4,012,015
97 4,012,016
153 A 4,012,017
165 4,012,018

CLASS 246

34 R 4,012,019

CLASS 248

14 4,012,020
23 4,012,021
475 A 4,012,022
489 4,012,023

CLASS 249

9 4,012,024
105 4,012,025
134 4,012,026

CLASS 250

199 4,012,633
201 4,012,634
221 4,012,635
363 S 4,012,636
475 4,012,637
491 4,012,638
492 B 4,012,639
493 4,012,640

CLASS 252

8.5 P 4,012,329
8.55 R 4,012,327
8.8 4,012,326
33.6 4,012,330
48.2 4,012,331
182 4,012,332
316 4,012,333
321 4,012,334
419 4,012,335
431 R 4,012,336
439 4,012,337
461 4,012,338
463 4,012,339
465 4,012,340
548 4,012,341
855 R 4,012,328

CLASS 260

2.5 B 4,012,342
2.5 FP 4,012,343
4 R 4,012,344
8 4,012,345
17 A 4,012,346
27 R 4,012,347
28.5 R 4,012,348
29.2 TN 4,012,349
29.3 4,012,350
29.6 BM 4,012,352
29.6 E 4,012,354
29.6 NR 4,012,353
29.6 R 4,012,351
29.7 NR 4,012,355
30.6 R 4,012,356
31.2 R 4,012,357
40 R 4,012,358
45.8 NE 4,012,359
45.9 NC 4,012,360
47 CZ 4,012,361
47 UA 4,012,362
75 R 4,012,363
77.5 D 4,012,364
78 R 4,012,365
79.7 4,012,366
112.5 R 4,012,367
125 4,012,368
146 R 4,012,369
152 4,012,370
155 4,012,371
4,012,372
239.3 P 4,012,373
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	350	243,662
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	167	243,659
	168	243,660
	245	243,663
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	34	243,666
D12—	78	243,667
	91	243,668
	101	243,669
	118	243,670
		243,671
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	200	243,673
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	24	243,698
	31	243,699
D14—	40	243,700
D15—	5	243,714
	29	243,708
	68	243,686
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D19—	88	243,688
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U. S. GOVERNMENT PRINTING OFFICE : O - 1977

U.S. DEPARTMENT OF COMMERCE

Juanita M. Kreps, Secretary

PATENT AND TRADEMARK OFFICE

[illegible], Commissioner